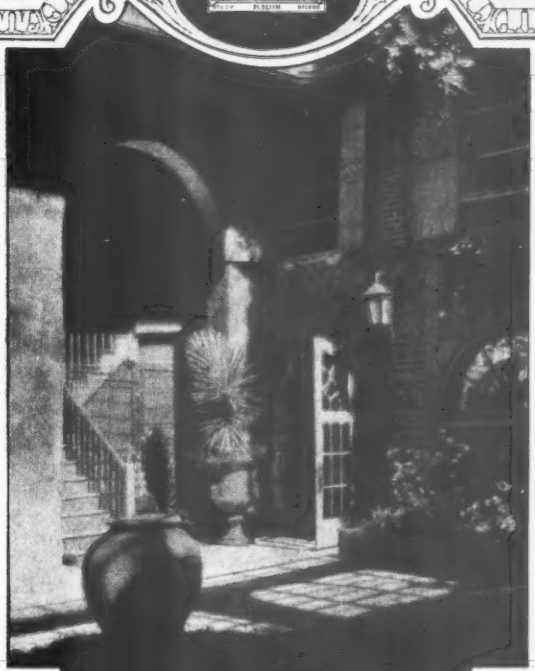
OCTOBER

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION



New Orleans
November 4-8

CONTENTS

Committee on Local Arrangements.....Frontispiece

ORIGINAL COMMUNICATIONS

Dietary Standards for the Adult Dental Patient.
By Dorothea F. Radusch, D.D.S., B.A.....1645
An Immediate Full Denture Technic.
By Harold Lytton Harris, D.D.S.....1656
The Value of Physical Studies in the Diagnosis and Treatment of Lesions of the Mouth.
By Leroy M. S. Miner, M.D., D.M.D., D.S.....1676
Hyperparathyroidism, a New Consideration for the Dentist.
By Joseph F. Borg, M.D.....1683
Differential Diagnosis of Inflammations Confronting the Dentist.
By Mathew Podolin, D.D.S., M.S.D.....1694
Comparative Values of Modern Denture Materials.
By J. B. Hathorn, D.D.S.....1703
Simplicity in Orthodontic Mechanisms with Special Emphasis on the Round Labial Arch.
By Clarence W. Koch, D.D.S.....1712
Dental Caries and Paradental Disturbances: I. Importance of an Adequate Diet for Health of Teeth and Paradentium.
By Hermann Becks, M.D., D.D.S., and Nina Simmonds, Sc.D.....1724
Importance of Gold Foil to the General Practitioner.
By Earl D. Harrison, D.D.S.....1738
Certified Impression Compounds, A.D.A. Specification No. 3.....1742
Responsibility of the Clinician in Tracing the Transmission of Syphilis.
By Malcolm Wallace Carr, D.D.S., F.A.C.D.....1743

EDITORIAL DEPARTMENT

The Coming New Orleans Meeting.—An Interesting Relic.—Accepted Dental Remedies 1935.—Rethinking the Way.—"For Dental Students."....1746-1757

Practice in Paragraphs.....1757

COUNCIL ON DENTAL THERAPEUTICS

Accepted Dental Remedies.....1759
Stera-Kleen—Not Acceptable for A.D.R.....1759
Sodium Perborate: Limitations of Its Use.....1761

BUREAU OF PUBLIC RELATIONS

Public Health Aspects of Vincent's Infection.
By J. M. Wisan, D.D.S., F.A.P.H.A.....1765
Dorothy Dot and Dorothy Dod.....1776

DENTAL ECONOMICS

Social Security.....1778
Report of A.D.A. Officials on Compulsory Health Insurance Systems in Europe..1778

THE NEW ORLEANS SESSION

Official Call.....1784
General Program.....1785
The Scientific Sections.....1788
General Clinic Program.....1794
The New Orleans Session.....1802
Railroad Rates to New Orleans, La.....1807
Directory of Commercial Exhibitors.....1811
Members of the House of Delegates 1935.....1812

CURRENT LITERATURE

Abstracts.....1817

NEWS

State, General and Foreign News.....1824

MISCELLANY

Book Reviews.....1829
Correspondence.....1830

Announcements.....1831

LIBRARY BUREAU

Recent Books Worth Borrowing or Buying.....1836

ADVERTISEMENTS

Index to Advertisements.....A-53
Classified Section.....A-44

The Journal of the American Dental Association. Vol. XXII, No. 10. Published by the American Dental Association, 212 East Superior Street, Chicago, Ill. Yearly subscription $5.00. Entered as second-class matter, May 1, 1928, at the postoffice at Chicago, Ill., under the act of Aug. 24, 1912. Published monthly.

Copyright, 1935, by the American Dental Association.

COMMITTEE ON LOCAL ARRANGEMENTS
Seventy-Seventh Annual Session of the American Dental Association, New Orleans, La., November 4-8.

THE JOURNAL
of the AMERICAN DENTAL ASSOCIATION

Vol. 22 OCTOBER, 1935 No. 10

Original Communications

DIETARY STANDARDS FOR THE ADULT DENTAL PATIENT

By DOROTHEA F. RADUSCH, D.D.S., B.A., Minneapolis, Minn.

WHAT is a dietary standard? Usually, it is what a family buys and eats; but many diets, though costly, are inadequate when gaged by the standards generally accepted by recognized authorities on nutrition. Many families, even on a reduced income, could afford adequate diets if they knew the requirements of a good dietary.

Numerous studies of average American dietaries have indicated that deficiencies of calcium and vitamins are relatively frequent. Such deficiencies lower the vigor of the body and lessen its ability to resist disease. Dietary deficiencies may have oral manifestations before other conditions are readily detectable. Thus, the dentist has the responsibility of so educating his patients in the elements of dietetics that they may choose their food intelligently.

Since the dentist must deal not only with the problems of tooth structure and caries, but also with those of the soft tissues and of the bone, he must consider the basic physiologic reactions of these tissues during development and maintenance. It has been shown that the bony structures of the body are the storehouse for calcium and phosphorus. These structures are not inert substances, but are constantly in a state of flux, being influenced by variations in body chemistry. Alternation of formation, destruction and rebuilding continue as long as the bone functions as an organ of support. (Bauer, Aub, Albright.[1]) It is quite possible that appendages such as hair, teeth and nails, being less essential to body economy, may be drawn on first when the daily intake of mineral elements and vitamins is lower than is needed to maintain a physiologic balance. In animal experimentation, it has been shown that the alveolar process is more susceptible to slight dietary faults than are the long bones, and

1. Bauer, Walter,; Aub, J. C., and Albright, F.: Study of Bone Trabeculae as Readily Available Reserve Supply of Calcium, J. Exper. Med., 49:145-163 (Jan.) 1929.

in puppies it responds more slowly to therapeutic measures. (Becks and Weber,[2] and Jones and Simonton.[3])

Many people believe that much of the information obtained from animal experimentation cannot be applied to man; yet when care is taken in setting up comparable situations, such criticism does not hold. The animal life cycle is so short as compared to that of man that responses to all changes in the environment of the animal are relatively rapid. When results of animal experimentation are applied to man, it must be remembered that, in addition to species differences, the time element is important. Wolbach and Howe[4] reported epithelial degenerative changes in vitamin A deficiency in white rats as occurring only occasionally after fifty days on the deficient diet, but consistently after sixty days. These intervals are comparable to four years and two months and five years of the human cycle. Again, the report of Hess, Lewis, and Barenberg[5] as to whether our dietary requires a vitamin A supplement considers the results of a five-month experimental period on human infants and concludes that the diet does not need supplementing. This time limit is comparable to five days of the rat life, and animal experimentation would not expect results from such a short period. Conclusions, as applied to man, then, must consider more carefully the relative length of time the condition is operating, as well as the conditions of the previous nutritive state. Without such consideration, it is feasible that a negative intake of essential elements over a long period of time may produce the cumulative result observable in every dental office, yet may not produce variations sufficiently discriminative to allow dependable interpretations of reports of clinical surveys, which are devised to show results of short-time variations in the diet, even though they may cover test periods several months or a year in length.

Medical tests, without consideration of conditions of the tooth structure and of the investing tissues, may indicate the normal, without due realization that the "normal" may have been maintained by sacrifice of such structures. It is important to realize that a calcium-poor condition of the body may coexist with every appearance of good health as indicated by a physical examination. (Sherman and Booher.[6])

Since special diets must be based on certain medical diagnosis, the dentist's interest should be confined to determining how nearly the patient's daily diet conforms to accepted standards. If such a study indicates definite deviations from accepted standards, the patient should be instructed as to needed adjustments, taking cognizance of the medical history; that is, when definite systemic conditions (diabetes, nephritis, etc.) are present, all dietary advice should be supervised by the physician. With the large percentage of persons on diets inadequate by comparison to even minimal and not optimal dietary standards, the dentist is

2. Becks, Hermann, and Weber, Moritz: Influence of Diet on Bone System with Special Reference to Alveolar Process and Labyrinthine Capsule, J.A.D.A., 18:197-265 (Feb.) 1931.

3. Jones, Martha, and Simonton, F. V.: Mineral Metabolism in Relation to Alveolar Atrophy in Dogs, J.A.D.A., 15:881-911 (May) 1928.

4. Wolbach, S. B., and Howe, P. R.: Epithelial Repair in Recovery from Vitamin A Deficiency, J. Exper. Med., 57:511-526 (March) 1933.

5. Hess, A. F.; Lewis, J. M., and Barenberg, M. D.: Does Our Dietary Require Vitamin A Supplement? J.A.M.A., 101:657-663 (Aug. 26) 1933.

6. Sherman, H. C., and Booher, L. E.: Calcium Content of Body in Relation to That of Food, J. Biol. Chem., 93:93-103 (Jan.) 1931.

TABLE 1.—DAILY DIETARY STANDARDS

Average man			150 pounds		70 kilograms		3,000 calories			
Average woman			132 pounds		60 kilograms		2,300-2,500 calories			
								Vitamins		
Protein	Fat	Carbohydrate	Calcium	Phosphorus	Iron	Iodine	A	B & G	C	D
1 gm. per kg.	35% of calories	45-50% of calories	0.68 gm.	1.32 gm.	0.015 gm.	0.001 gm.	3,000 units	900 units	60 units	Augment

GROUP 1 Essentials

MEAT	MILK	BUTTER	EGG	FRUIT			VEGETABLE	
One serving of meat, fish, or poultry	One pint in any form: beverage, cocoa, cream soup, cheese, ice cream	Two tbsp. or more	One	One serving: orange, grapefruit, tomato	One or more servings: raw or cooked: banana, berries, apricots, pears, pineapple, apple, plum, etc.	One serving: raw lettuce, cabbage, carrot, spinach, watercress, celery, etc.	One serving: cooked string beans, lima beans, squash, asparagus, beets, turnips, spinach, carrot, peas, etc.	One serving: potato, sweet or white

GROUP II Add to satisfy calories and to complete standards:
Any sufficient number of servings:

Cereals (grain products)		Sugar
Bread	Cake	and
Breakfast cereal	Cookies	sugar preparations
Macaroni—spaghetti	Pancake	
Rice	Pastry	
Sweet corn	Waffles	

justified in teaching his patients to approximate known standards, for good nutrition is one of the basic rules of hygiene.

Should a study of the patient's diet indicate close conformity to accepted standards, and yet untoward dental conditions be present, the patient should be referred to a physician for examination for possible endocrine or other systemic conditions which preclude the proper utilization of ingested food elements. One must also keep in mind the fact that a diet either adequate or optimal in all respects at the time the survey is taken cannot overcome entirely early deficiencies with their attendant results, so that it is possible to find a patient taking a good diet and yet showing symptoms of disease because of earlier inadequacies.

Nutritional standards can be only approximate or average, for they must allow a certain leeway to compensate for variation both in food composition and in individual utilization of foodstuffs. The normal individual mechanism has the capacity of self-adjustment to a large extent and can take from the ingested foodstuffs the elements necessary for tissue and cell maintenance and repair. It can adjust itself to lowered intake of certain elements provided the level does not go below the minimum, which varies from person to person and from time to time in the same person. It can often substitute one element for part of another and, if offered a wide range of substances, can develop a high degree of efficiency in the use of these elements. Because it requires expensive and searching experimentation to determine apparently minimal requirements for each person, requirements have been based on studies of numbers of tests which include the lowest and the highest minimals. To further assure adequacy because of great individual variation, a margin of safety of 50 per cent of the requirement has been added and this figure is called the standard. For example, the requirement for calcium was determined as 0.45 gm., to which is added 50 per cent, giving a standard of 0.68 gm. Standards as accepted by such authorities as Sherman, McCollum and Rose indicate this margin of saftey, yet, in all instances, variations augmenting the standard, except in the case of calories, are deemed advisable.

Because of the latitude of accepted standards, it is possible to set up a comparatively simple chart for analyzing food intake. More detailed analysis is necessary in special cases and must be made by one who has had intensive training. For the average normal adult dental patient, a simple analysis will give the necessary information. Careful study has shown that, for such cases, food elements, ash constituents and vitamins will be adequately provided without need for further, detailed calculations if foods are chosen each day which include the requisite items from each of the designated groups in the chart.

The patient should be requested to keep a record of all foods eaten during three days, preferably not consecutive days, with notations as to amounts; for example, 3 slices white bread with butter, 2 eggs, 1 serving of carrots, cereal with 2 teaspoons of sugar and one-half a cup of milk. It is important that the record include foods eaten by the patient, and not foods served to him, for herein lies the explanation of many cases of difference in individual members of a family group. Foods eaten between meals must also be counted. As most patients have at least a limited knowledge of what they should eat, information obtained by a record will show inaccuracies, because patients will often, consciously or otherwise, vary food habits while keeping a record. Records of alternate days tend

TABLE 2.—MINERAL CONTENT OF COMMON FOODSTUFFS

TABLE 2.—MINERAL CONTENT OF COMMON FOODSTUFFS

Food	Iron 0.00126 gm. (1 egg yolk) One-tenth standard		Phosphorus 0.223 gm. (1 cup of milk) One-fifth standard		Calcium 0.228 gm. (1 cup of milk) One-third standard	
	Amount	Calories	Amount	Calories	Amount	Calories
Apricots, dried†	3 small halves	47	32 small halves	536	69 small halves	1,126
fresh*	2, 1½ inches diameter	54	18 whole	486	40 whole	1,080
Beefsteak*†	2½ x 2½ x ¼ inch piece	46	5 x 3½ x ½ inch piece	159	5 pounds	
Carrot*	¾ cup, diced	48	3 cups diced	199	12 whole or 3½ cups diced	212
Cheese (American)†‡	⅞ cup grated or 3 x 2 x 1 inch cube	458	1 x 2 x 1 inch piece	153	1 x 1½ x 1 inch piece	120
Egg*	1	74	2½	183	9	646
Lettuce, head	¾ head	48	2¾ heads	176	2¾ heads	176
leaf	4-8 leaves					
Lima beans*†	¼ cup	58	¾ cup	174	5 cups	1,160
Liver (beef)*	1½ x 1½ x ½ inch piece	18	3 x 6 x ½ inch piece		4½ pounds	
Milk†‡	2½ cups	425	1 cup	170	1 cup	170
Orange*	2 medium	91	10 medium	450	6 medium	270
Peas*	½ cup	57	1¼ cups	141	8 cups	821
Potato (white)	1½ medium	122	3	315	14-15	1,687
Shredded wheat*	1 biscuit	101	2½ biscuits		24 biscuits	
Spinach*	1 tablespoon	4	1 cup	66	1½ cups	86
Tomato (canned)*	6½ tablespoons	20	3¾ cups	180	11½ cups	550
Wholewheat bread*†	3 slices	196	5 slices	318	21 slices	1,134

* Good source of iron.
† Good source of phosphorus.
‡ Good source of calcium.
From 30-60 per cent of mineral is contained in liquor of fruits and vegetables.
Spaces are left blank in Tables 2 and 3 whenever reliable experimental results are not available.

to overcome discrepancies. The information thus obtained can be checked with the following charts, which were set up on the basis of the living habits, including moderate exercise, of the average man and average woman. (Table 1.)

Calories and grams of protein should be considered on the basis of what a person should weigh. If, from year to year, the adult body keeps in good condition for its work and maintains a fairly constant weight which is in correct proportion to its height, showing that a reasonable amount of fat is being carried, it is reasonably certain that the fuel value of the food eaten in the course of a year is substantially that suited to the activity. If a patient is more than 20 per cent overweight or 10 per cent underweight, the dietary should be under the supervision of the physician, because, in such instances, special care must be taken to maintain essential elements, lessening or increasing calories as necessary.

Standards of other essential food elements are the same for all adults, regardless of weight, unless deviations from normal in size and weight are extreme or the adult is under certain conditions of stress, such as pregnancy or lactation.

The protein standard is set on the assumption that there is adequate provision through other food elements to meet the energy requirement and the protein ingested provides a complete and adequate assortment of all the amino-acids essential to the formation of tissue protein. Protein from animal sources is usually complete or adequate in this sense, but an adequate supply of the amino-acids cannot be obtained from the majority of vegetable proteins, as, for example, the proteins of corn, wheat, barley and beans. Proteins vary not only in their content of amino-acids, but also in the proportionate amounts present. As maintenance and growth do not occur in the absence of certain amino-acids, for their synthesis in the animal body does not take place, it is of utmost importance to allow a liberal margin of safety, particularly when part of the protein is derived from plant sources. One gram per kilogram, or from 60 to 70 gm. daily, will provide ample protein, when both sources of protein are utilized, with a proportion of two-thirds from animal sources.

A certain percentage of fat in the diet is vital, not only because of the fat-soluble vitamins commonly contained, but also to maintain the proper utilization of food elements, and to furnish unsaturated fatty acids that cannot be synthesized. Animals and human beings on a fat-free or low-fat diet tend to have disturbances of the skin and hair, as well as showing greater tendency to concretions in the urinary tract. Burr and Burr[7] have shown that certain unsaturated fatty acids must be taken in the food to insure proper nutrition. The usual proportion of fat is 35 per cent of the caloric requirement.

Carbohydrate is generally considered as furnishing the energy of the human body, but the well-adjusted body is not restricted to any one foodstuff for the support of work. It has the very great power of converting one nutrient into, or using it in place of, another, and to so utilize its resources that the total potential energy of all nutrients is economically employed to support the work of the organism. Carbohydrate, fat and protein stand in close mutual relationship. Because of economy and, to many people, palatability, carbohydrates are used most extensively as a source of energy, usually

7. Burr, G. O., and Burr, M. M.: New Deficiency Disease Produced by Rigid Exclusion of Fat from Diet, J. Biol. Chem., 82:345-367 (May) 1929; Nature and Rôle of Fatty Acids Essential in Nutrition, ibid., 86:578-621 (April) 1930.

TABLE 3.—VITAMIN CONTENT OF COMMON FOODSTUFFS*

TABLE 3.—VITAMIN CONTENT OF COMMON FOODSTUFFS*

Food	Vitamin A 300 units		Vitamins B & G 90 units		Vitamin C 6 units	
One-tenth standard:	Amount	Calories	Amount	Calories	Amount	Calories
Banana†#	½ medium	86	2 medium	310	1¾ x 1¼ inch	35
Butter†	2½ teaspoons	70				
Cabbage (uncooked)#	9 cups, chopped		3 cups, chopped		½ cup, chopped	6
Carrot (raw)†#	2¼ inch diameter x ¼ inch	3	4½ medium	140	1½ inch diameter x 6 inch	42
Egg yolk†	1 teaspoon	18	3 yolks			
Lettuce (head)†#	½ head	16	¾ head	48	6-8 leaves	6
(leaf)†	8 leaves	6				
Milk†‡#	$\frac{9}{10}$ cup	94	1 cup	170	Raw: 12 tablespoons Pasteurized ?	120
Orange#	3½ medium	167	3 medium	117	3 teaspoons	6
Peas†‡#	½ cup	45	5 tablespoons	41	2 tablespoons	11
Potato (white-cooked)#	9-10 medium	882	3 medium	265	1¾ inch diameter x 1½ inches	46
Potato(sweet)†‡	1¾ inch diameter x 1½ inches	56	¾ medium	185		
Round steak	8 x 8 x ⅜ inch piece	375				
String beans†#	⅔ cup	18	2¼ cups	60	⅔ cup	18
Spinach (raw)†#	1 leaf	1			1 leaf	1
(canned)†‡#	1 leaf	1	5 tablespoons	20	3 tablespoons	11
(home-cooked)†#					6 tablespoons	22
Tomato (cooked)†‡#	¼ cup	12	1 small cup	45	3 tablespoons	2
Whole wheat bread‡			2 slices 3 x 3¾ x ½ inch	144		

* Vitamin D is found in egg yolk, sea food and sunlight.

† Good source of vitamin A.

‡ Good source of vitamins B and G.

\# Good source of vitamin C.

making up from 45 to 50 per cent of the total calories.

Standards for mineral as well as for nitrogen (protein) were set up by averaging results of balance experiments which measure and analyze all intake and excretion for set periods. Fifty per cent is added to the amount required to maintain equilibrium to compensate for individual differences and food-composition differences, because none of the latter figures can be fixed values, being approximately relative values of mineral and vitamin content.

Meltzer, in the *Transactions of the Association of American Physicians,* made the statement that calcium is capable of correcting the disturbances of inorganic equilibrium in the animal body, whatever the direction of the deviation from normal may be. Calcium also has a favorable influence on the economy of iron, it being possible to maintain equilibrium on a smaller amount when the food contains an abundance of calcium. This is of special importance because of the greater difficulty in approximating the iron standard. In order to obtain the standard of 0.68 gm. of calcium, it is best to use a good source, such as milk, and, for the adult, 1 pint daily in some form is necessary. (Table 2.)

Phosphorus, which is essential to growth, is one of the limiting factors in bone formation. In the adult, phosphorus is required merely to replace loss. As phosphorus is plentiful, dietary analyses indicate relatively adequate intake of this element, only 4 per cent of average dietaries showing deficiency. The standard is set at 1.32 gm. daily.

The iron requirement varies somewhat with the individual and with the nature of the diet, the accepted standard being 0.015 gm. daily. The allowance for women needs to be more liberal and should be increased to 0.018 gm. during certain periods of special iron need. Unlike calcium, which is also a mineral element hard to supply in the diet by common foodstuffs, but for which there is one excellent source—milk, of which a pint a day should be taken—iron is found richly in generally disliked, expensive and not commonly used foods, such as liver, spinach and dried fruits. (Table 2.) Again, as iron is water-soluble, from 30 to 60 per cent is often discarded in the liquor of cooked vegetables. Because iron, as well as vitamin B, is found in the bran portions of cereals, unless individual idiosyncrasies forbid, it is well to take half of the breadstuffs or other grain products in "whole," or "dark," forms. Since the proportion of red meats in many diets has been lessened, other food sources must assist in supplying iron. Study of the table on the iron content of foods indicates the great need for education and readjustment of common dietary habits.

The iodine standard of 0.001 gm. daily will be filled by the use of iodized salt and by seafood once weekly. The iodine requirement is of special interest in the Great Lakes district, where common foods are almost entirely lacking in this element and goiter or other thyroid disturbances are relatively frequent.

Standards in units of vitamins have been established, yet there is reason to believe that intake of vitamins much more abundant than is absolutely necessary is often advantageous. It must be remembered, in determining vitamin dosage, that curative doses generally need to be larger than protective doses. All standards as reported in this summary are considered as protective.

Vitamin A is essential to normal nutrition and health at all ages. Lack of this vitamin brings about general weakening of the body and of its ability to resist infection.

TABLE 4.—AUXILIARY CHART OF SAMPLE FOOD GROUPS [illegible]

TABLE 4.—AUXILIARY CHART OF SAMPLE FROM GROUP I*

	Group I	Standard
Calories	1,142	2,300-3,000
Protein	45.6 gm.	60-70 gm.
Fat	74.5 gm.—22½% of total calories	35%
Carbohydrate	72.0 gm.—10% of total calories	45-50%
Calcium	0.791 gm.	0.68 gm.
Phosphorus	0.903 gm.	1.32 gm.
Iron	0.0096 gm.	0.015 gm.

* Vitamins adequate except B and D; calories, carbohydrate, phosphorus and iron, low.

Tentatively, data for longevity indicate a distinct tendency toward longer life when the diet is richer in vitamin A. More specifically, the dentist is interested in this vitamin because experimental work suggests that deficiency of vitamin A or carotene plays an important part not only in the development of periodontal tissues, but also in the control of the onset of periodontal disease. Vitamin A seems to have a definite influence over the health and disease of all epithelial tissues. The work of Sherman and Mellanby indicates that deficiency during childhood produces greater susceptibility in the adult, even though the amount of vitamin A supplied to the adult is high.

Vitamin A is found in animal and plant material, but the latter form is relatively more stable and is associated with the pigment carotene, which probably is not identical with vitamin A, but is the precursor. Carotene is synthesized by sea and land plants under the influence of light. It can be more or less completely converted into vitamin A in the animal body, and can be stored as such. Consequently, both primary (carotene) and secondary (vitamin A) forms are available for animal or human nutrition.

There is a definite correlation between the carotene color (yellow) and high vitamin A content of foodstuffs, and between the chlorophyll color (green) and high vitamin A. This is obvious in the tables on comparative unit values of common foodstuffs. (Table 3.) Vitamin A is fat-soluble, and therefore not readily lost in food preparation. Any daily excess can be stored.

Quite recently, vitamin B was found to be composed of two or more compounds, variously termed. The name vitamin B is now customarily applied to that fraction also termed B_1, lack of which brings about nervous symptoms (beriberi) and gastro-intestinal dysfunc-

tion, including lack of appetite. There is little or no synthesis of vitamin B in the human being, although cows and ruminants can synthesize B because of the action of bacteria in the intestinal tract. Cereals, particularly brewer's yeast, are the best sources of vitamin B. The standard is set at thirty units per hundred calories, the total units for the average adult being 900.

The other part of the vitamin B complex is called G or B_2, extreme lack of which produces pellagra. This vitamin, which influences growth and the general health particularly, is found in yeast, milk, lean meat and green leaves. It occurs commonly along with B_1, the only food containing G without B being egg-white. Vitamins B and G are water-soluble and storage of both is poor, the system being dependent on the daily intake. Standards for G have not been definitely tested, but it is generally considered that if the vitamin B standard is satisfied along with other standards, adequate G will be present. In part, the significant improvement in longevity found by Sherman and Campbell resulting from improving a diet already adequate by increasing the proportion of milk is due to higher vitamin G as well as additional vitamin A and calcium.

The standard of thirty units of vitamin C was set up by laboratory tests on animals (guinea-pigs) as one which will just protect from scurvy. Individual experiments by Goettsch, Höjer and Eddy[8] indicate that twice the protective dose against scurvy is needed to safeguard the teeth, sixty units being thus a better standard for general purposes.

Although vitamin C sources are very common, as the vitamin is water-soluble and quite readily destroyed by oxidation especially in alkaline mediums, attention must be given to providing uncooked foods or foods known by tests to be little affected in C content by cooking (tomato). Vitamin C cannot be synthesized or stored in the body. Previous liberal antiscorbutic feeding does not enable animals to survive much longer when placed on a scorbutic diet than those animals previously on low antiscorbutic diet. It is necessary to depend on daily food supplies rather than on stores carried in the body. Still, in latent scurvy cases, symptoms will develop on a scorbutic diet more quickly than in those on a previously adequate diet.

Vitamin D is fat-soluble and was at first thought to be a part of vitamin A. Ergosterol, the precursor of D, is the substance in foods and skin that can be activated by sunshine or ultraviolet rays. This is why either vitamin D or light can help organisms utilize advantageously the available calcium and phosphorus, but of course cannot replace an actual deficiency. Vitamin D has an important rôle in calcium-phosphorus metabolism, and acts in one of three ways: by changing the reaction of the intestinal tract, favoring absorption of ingested calcium; by influencing the parathyroid glands, or by influencing the bone or dentin tissue cells directly.

Vitamin D is not abundantly furnished in most food materials, being present mainly in fish oils and egg yolk, and, in small dosage, in butterfat, whole milk and green leafy foods. Calcium balance experiments by Hart, Steenbock and others indicate that there is some factor in green plant tissues distinct from vitamins A, B and C which functions in the calcium economy of adults as well as that of the young. This substance may be D or some unidentified vitamin.

Although vitamin D can be stored, it cannot be synthesized by the human being, and in regions where seafoods are

8. Goettsch, Höjer and Eddy: The Vitamins, 1931.

unconmon and sunlight limited, it is wise to increase the resistance during certain seasons by means of viosterol, cod liver oil, haliver oil or concentrates.

Vitamin E, which influences reproduction, has not been considered in this table because of its wide distribution in foodstuffs and the small dosage necessary. It is apparently a problem only in the purified diets of laboratory animals.

Foodstuffs (Table 1) are divided into two groups, Group I including such foods as will supply the majority of the essentials other than calories or energy, and Group II including primarily energy foods or foods of high caloric value. The daily diet should include from each of the divisions of Group I: one serving of meat, fish or fowl, one-half pint of milk, two tablespoons of butter, one egg, one serving of citrus fruit or tomato, one of other fruit cooked or uncooked, one serving of raw vegetable, one serving of cooked vegetable and one serving of potato.

Servings as recommended under Group I will provide the majority of essential elements, as shown by the example in Table 4. Foods chosen from the various divisions were: beef (4 by 4 by ¼ inches), one-half pint of milk, one egg, one orange, one serving of blueberries, one-fourth head of lettuce, one serving of string beans, one medium potato, two tablespoons of butter. By checking composition values against the original standards, it is seen that a caloric value of 1,141 as against 2,500-3,000 calories indicates that the foods which are good sources of energy have as yet not been included. Protein of 45.6 gm. as compared to 60 or 70 gm. is not quite enough. Foods of the cereal type in Group II contain protein, bread containing approximately 3 gm. per slice, so that when caloric requirements have been met, protein will also be adequate both as to amount and as to the proportion of efficient or animal protein. Fat, at 22.5 per cent, will be augmented to 35 per cent by the caloric foods and salad oils. Carbohydrate at 10 per cent shows again that as yet the energy foods have not been included. Calcium at 0.791, slightly higher than standard, gives a margin of safety to take care of variations in food composition and forms of calcium which are found present on analysis of foods, but are not so readily utilized by the human organism. Phosphorus at 0.903 is somewhat low, but, again, the energy cereals are good sources of phosphorus, and the generally large intake of these foods will bring the figure up to standard. A larger serving of meat would definitely assure sufficient phosphorus and would aid in meeting the iron requirements. Iron at 0.009 gm. is greatly below standard. This has been computed, as reference to the list of foods chosen will show, without such high sources of iron as liver, spinach or dried fruits, but including red meat and egg yolk. This item, which emphasizes the difficulty in obtaining the recommended amount of iron in the daily diet, may explain the common occurrence of anemia in adults, especially in women.

Vitamin A, at 3,000 units plus, is adequate; G, with one pint milk and fruits and vegetables, is adequate; C, at 100 units plus, is adequate; D, if sunshine is available, is satisfactory; B is not satisfactory, but will be increased by the cereal intake. Thus, after first making provision for the majority of nutrient essentials by choosing foods from each of the divisions of Group I, the standards should be completed by the addition of energy foods from Group II.

Study of the charts on dietary standards indicates that individual appetite proves to be an inadequate guide to such quantitative combinations of the differ-

ent types of foods as shall lead to a well-balanced intake of each of the many essential food elements. Under modern conditions, scientific dietary standards based on a knowledge of food chemistry and nutritive requirements constitute the most rational guide to the formation of hygienic and economic habits in the use of food.

Variety in the foodstuffs used is more likely to bring about a balanced dietary, yet variety in itself does not necessarily assure adequate nutrition. The chemical composition of the foods is important. That is why primitive Eskimo diets, though limited to a few foods, show comparable but higher mineral and vitamin values than modern American dietaries. Ease or difficulty in satisfying food requirements depends partly on the locality, some substances being more difficult to obtain in certain regions, as, for example, iodine in the Great Lakes region. Those who must depend on restaurant menus and who must economize may find it very practical to augment the diet with laboratory preparations, particularly as to vitamin A. Likewise, as vitamin D is so seldom found in foods, and sunshine in certain areas is limited, the use of vitamin D too in concentrated form is often advisable. The common dietary of meat, potato, bread and pie, composed largely of highly refined and processed foodstuffs, should be augmented if a better-than-average nutritive condition and health are to be assured. A diet of good nutritional standard is of more importance than the consistency of the foodstuffs; that is, the chemical qualities of the diet are of greater significance than the mechanical qualities as regards good general health and, more specifically, good oral health. (Mellanby,[9] 1930, and Howitt, Fleming and Simonton,[10] 1928.)

The combined effects of the newer knowledge of nutrition and the development of methods of preservation, transportation and marketing should so influence diets that they will be more adequate than previously. A balanced diet is a paramount necessity for physical health, growth and function, for any deficiency in the diet which impairs the general health will accentuate the effect of the inadequacy of the special item.

909 Metropolitan Bank Building.

9. Mellanby, May: Diet and Teeth, Part 2, Medical Research Council, Special Report, Series 153, 1930, chap. 2.

10. Howitt, Beatrice F.; Fleming, W. C., and Simonton, F. V.: Study of Effects upon Hygiene and Microbiology of Mouth of Various Diets, Without and with Use of Toothbrush, D. Cosmos, 70:575 (June) 1928.

AN IMMEDIATE FULL DENTURE TECHNIC*

By HAROLD LYTTON HARRIS, D.D.S., St. Paul, Minn.

THE procedure of extracting the teeth and inserting a full denture of some type or other is not new. In fact, it is probably as old as dentistry itself. Many technics for the construction of immediate full dentures have been offered the profession in the years past. Open face dentures, that is, dentures with socket-set teeth and no labial rim, which at best are only partial dentures without clasps; dentures constructed for cases in-

*Read before the Section on Full Dentures at the Seventy-First Annual Midwinter Clinic of the Chicago Dental Society, Feb. 19, 1935.

volving the extraction of both anterior and posterior teeth at one sitting, with no thought to the accuracy of the peripheral borders or any other requisites of a full denture; dentures constructed of materials designed to last not more than a week or two—all these are in use at the present time, offered by the profession as a means of helping the patient over that trying, uncomfortable, edentulous period which follows the extraction of the remaining natural teeth, until regular full dentures can be constructed. While there is no doubt that these dentures serve their purpose admirably, yet their use is rapidly giving way to more modern technics, which deliver to the patient a finished denture comparable in every detail to those dentures completed from impressions of the edentulous mouth. I advise those particularly interested in the history of this subject to send to the Librarian of the American Dental Association for the package library on "Immediate Denture Service," an excellent collection of twenty-nine articles on the subject by twenty-three different writers, and a clear picture of the various methods and procedures advocated from time to time.

The writers of these articles differ widely on many important steps; likewise, they are in accord on many things. They agree, for example, that the insertion of an immediate denture is an advantageous service, for many reasons, to the patient who is about to become edentulous, and, further, that the service constitutes what is commonly accepted as good practice. They agree, for the most part, that conservatism must be the watchword when the surgical treatment of the alveolar process is considered; that as much of the alveolar process be preserved as possible, and that the radical alveolectomy which was so prevalent for a while be condemned. The opinion also seems to be, and it is one with which I heartily agree, that the words "temporary" and "permanent" should be stricken from prosthetic nomenclature. As the so-called "temporary" denture is usually constructed of the same type of materials as those designated as "permanent," it is obvious that dentists have been using the

Fig. 1.—Appearance of patient (left) before and (right) after insertion of immediate full upper and lower dentures.

word "temporary" to describe a condition of the mouth and not the denture to which the adjective has been attached. Because we are dealing with living bone and living tissues, the condition of the mouth is an ever-changing one, more rapid, of course, in the first eight or nine months immediately following the extraction, yet continuing on through life with various degrees of rapidity. It is little wonder, therefore, that, in a suit for malpractice cited by one of the writers, in which the question to be decided was whether the dentist or the patient was right in his version of what constituted a "temporary denture," the opinion rendered was that the conditions which prompted the dentist to describe his denture as "temporary" could be made in no way to coincide with any accepted definition of the word, and the same reasoning holds true for the word "permanent."

I have found it more satisfactory to describe these dentures to my patients as their "first" dentures, the next set as the "second," the next, the "third," and so on. I believe this gives the patient a true description of the denture that I am inserting for him. If it is an immediate denture, therefore, it is his first denture, and he is usually advised that the changes in the mouth tissue will be rapid and that the second set should be constructed in approximately a year. He may, for his own comfort, require rebasing of the first denture in four or five months, and again

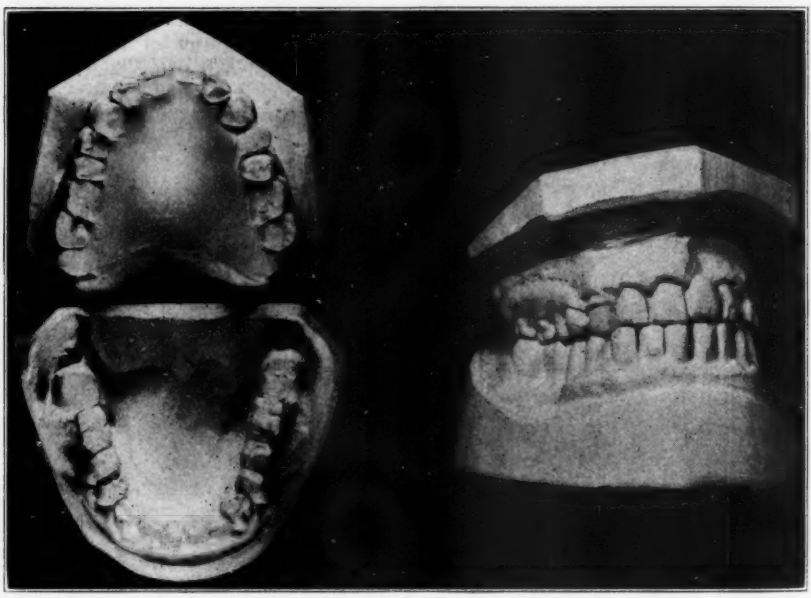


Fig. 2.—Study models of case in Figure 1, showing number of teeth present and condition of occlusion. In the model to the right, overbite is present on the left side, in the anterior teeth, and end-to-end occlusion on the right side, owing to labial migration of the lower right units, central and lateral incisors and cuspid.

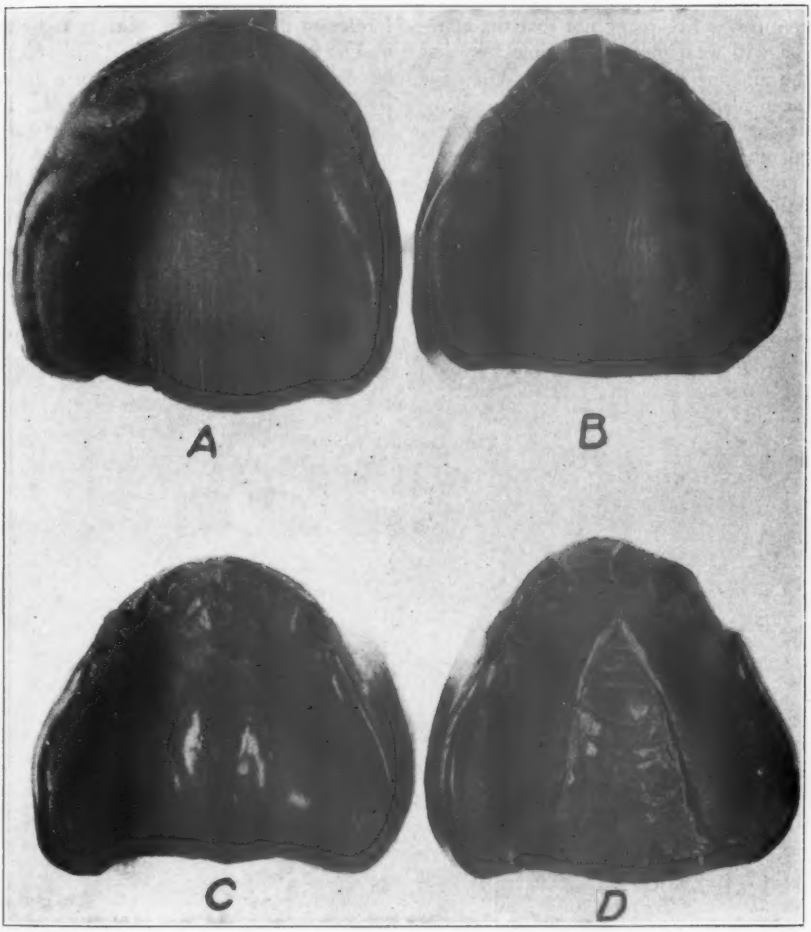


Fig. 3.—*A*, compound impression after first insertion, now checked for proper distribution, the compound then being removed from the metal tray. *B*, labial rim of compound removed to incisal edge from the distal aspect of the right to the distal aspect of the left remaining anterior teeth. The excess compound has been removed to the height of convexity of the buccal rims, and the posterior border straightened up, a known excess remaining. *C*, buccal rims carefully muscle-trimmed to correct height and width. *D*, compound tray prepared for plaster wash impression.

at the end of a year, if his economic condition at that time prohibits the construction of the second set; and he is told that a limited correction may be accomplished by rebasing the denture. If he has been edentulous a year or more, he is told, and in this I believe as the late Dr. Monson believed, that the life of a set of artificial

dentures is five years, not that the material will wear out in that time, but that the amount of change which will have taken place not only in the tissues comprising the seating area of the denture, but also in those structures which determine the vertical dimension of the face, will be enough to require a correction, either partial, by rebasing his present dentures, or complete, by the construction of a new set.

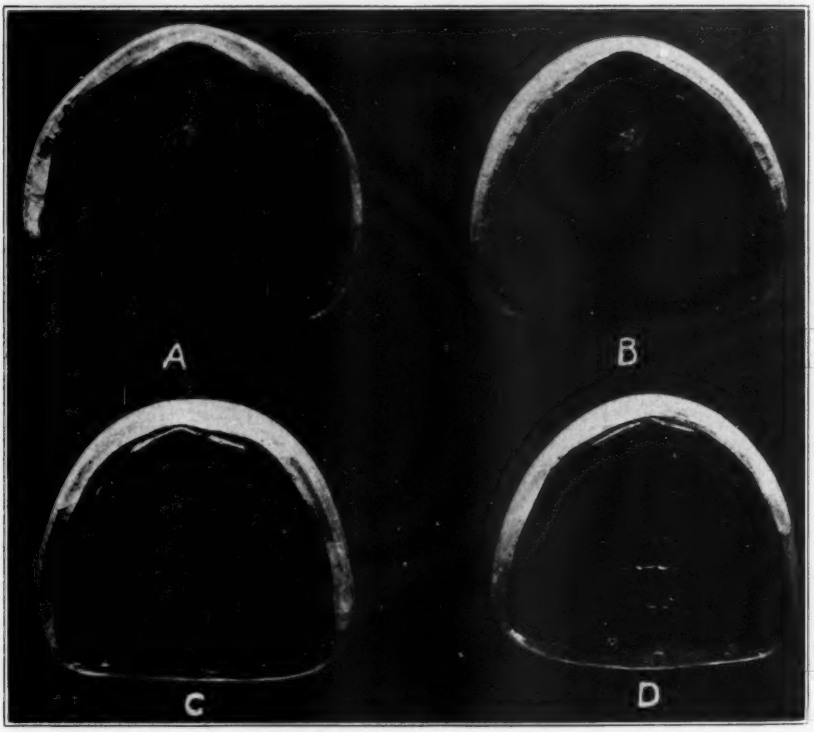


Fig. 4.—Corresponding steps in first part of regular edentulous impression technic.

In the above-mentioned group of writers, there is one man who has advocated a temporary denture which comes wholly within the meaning of the word. I refer to the immediate denture technic of Dayton Dunbar Campbell, in which he describes a temporary denture constructed of "trubase" and sealing wax. I have used his technic in the past and many times have felt indebted to him for a quick, convenient and practical way of handling an emergency. Since the adaptation of the full denture technic that I have been using to the cases requiring immediate denture service, I have found no necessity for using his method other than in an unusual type of case.

There is one other statement commonly made by many writers with which

I cannot possibly agree, namely, that any impression technic is satisfactory in the construction of immediate dentures. In other words, any impression taken in plaster, dentocoll, compound or any combination of these materials is satisfactory so long as it takes in all the area occupied by the natural teeth. Since these men know that this statement cannot be true for modern full denture construction, why should it be advocated for immediate dentures? The truth of the matter is that the accuracy of the impression of the remaining natural teeth is not so important a consideration as accuracy in the

Fig. 5.—Completed plaster impression, showing labial rim assembled and indelible tissue markings indicating area to be relieved and posterior plate line transferred to impression.

impression of many other areas of the mouth. We know that there are certain fundamentals which must be incorporated in impressions of the edentulous mouth. The equalization of the stresses exerted by a full denture on tissues that are capable of carrying those stresses is probably the most important requisite of a full denture impression. The fact that we have areas of varying degrees of resiliency, the fact that we must place a postdam pressure, which is simply stating that we place added stress along the posterior border of the denture, means that the impression must be taken in such a way that the tissues which have a different degree of resiliency will have the stresses of the denture equalized. There-

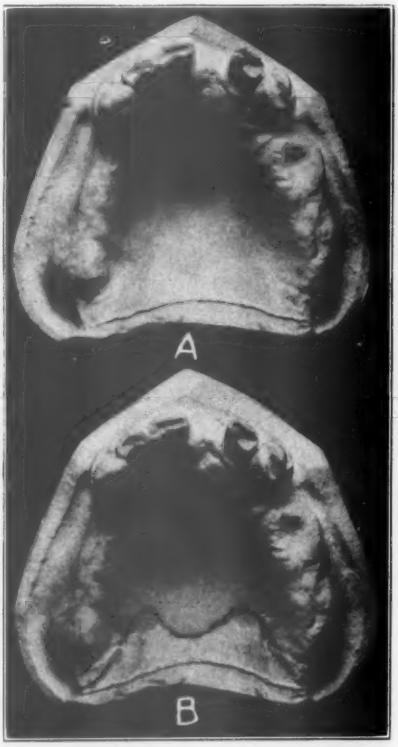


Fig. 6.—*A*, cast trimmed, ready for building trial plate. The embossed line definitely indicates the posterior border of the denture. *B*, area to be postdammed (outlined).

fore, I think a point of progress in this work is the adaptation to immediate denture construction of a sound method of full denture impression technic based upon

fundamental principles. The resulting impression incorporates the requirements of any regular edentulous impression and a full denture results which will be of service to the patient in the same manner as a denture made for a mouth that is already edentulous.

Obviously, the first step in any full denture technic is the examination of the patient. The points usually considered in the routine examination advocated for the edentulous patient must likewise be contemplated in the examination of the patient for whom an immediate denture is to be constructed. Thorough knowledge of the character of the muscle and soft tissue attachments, the classification of the throat form, the extent of the hard, nonresilient areas to be relieved, the condition of the temperomandibular joint in centric occlusion and all other conditions usually noted is essential. A complete roentgen-ray examination of the nonedentulous mouth is probably of greater importance than of the edentulous, though I do not wish to be considered as minimizing the importance of the roentgen rays in any type of denture construction. Compound impressions taken in sections are advocated that accurate study models may be run up. They are extremely valuable for a record of the case, for the information obtainable from them in esthetics and for a record of centric occlusion.

Fig. 7.—Upper and lower trial plates constructed of trubase and wax bite rims. Use of a metal strengthening bar in each is shown.

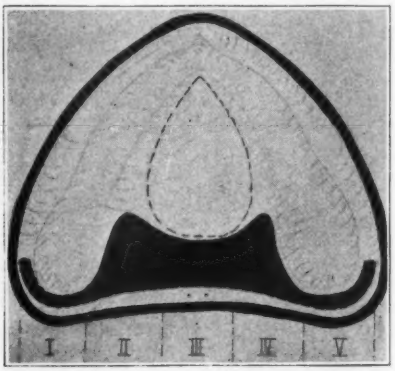


Fig. 8.—Postdam technic. The numerals indicate the five areas to be studied separately, though *I* and *V* are similar, *II* and *IV* are similar, and *III* is the median line section. The parallel dotted lines indicate the cut made with the No. 10 round bur. The shaded portion indicates the width of the postdam in the various areas.

Next, extraction of all teeth posterior to the cuspids should be planned. The procedure depends on the number of teeth present, the condition of the teeth and the health of the patient. The average case is handled by extracting the teeth on one side at one appointment, and in forty-eight hours extracting the teeth on the opposite side. If very few teeth are present, it is possible many times to extract all the posterior teeth. If the health of the patient is such that the family physician advises that only one tooth may be removed at a time, which is very unusual, though it has occurred, it is necessary to consider whether an immediate denture of the type described in this technic can be built for this type of patient, as this technic calls for the extraction of the anterior teeth at one setting. It is in this type of case that the temporary denture technic of Dr. Campbell serves a worthy purpose. After the posterior teeth are extracted, it is advisable to wait at least ten days before attempting to take the impression. The soreness is usually out of the tissue by that time, and it is of no advantage to wait any longer, unless soreness of the tissues requires it. If, for example, the patient is wearing a partial denture supplying all teeth posterior to the cuspid, it is, of course, possible to take the impression immediately. One can readily see how the number of teeth that must be extracted affects the waiting time before the impression may be taken.

Fig. 9.—Casts with trial plates correctly trimmed and in centric occlusion mounted on instrument.

Fig. 10.—Posterior teeth of both sides set up. The vertical dimension has been increased approximately 2 mm. The case can be tried in for verification at this point, if desired.

Before taking up in detail the technic of the construction of immediate dentures, I should like to discuss the subject

of esthetics. The esthetic possibilities in immediate denture service are great. In full denture work, it has been our complaint in the past that esthetics has been one of the difficulties because the edentulous patient comes to us with little or no guide as to the appearance or position of the teeth. The literature has been full of suggestions along the lines of taking study models of every patient for future reference.

In immediate denture service, the guide to esthetics is present. Many men advocate reproducing the natural teeth as closely as the artistic ability of the operator permits. Many beautiful reproductions have been made by the use of various methods for staining porcelain teeth, and by the use of fillings, in spite of the fact that we do not as yet have an entirely satisfactory selection of anterior porcelain teeth. It is my belief that some time should be spent talking the situation over with the patient, explaining the various possibilities as far as esthetic reproduction is concerned, and learning what the attitude of the patient is toward the new teeth. It has been my experience that the majority of people reaching the point where full dentures are necessary are not in favor of an accurate reproduction of the teeth which they are about to lose. Malposition of teeth, darkening by various kinds of fillings and root canal work, spacing because of loss of posterior teeth and a number of other conditions cause the average patient to feel, once he has made up his mind to lose those last natural teeth, that he wants an improvement, and I agree with him.

Other factors may materially affect the setting of the anterior teeth. The most important of these is the change in appearance that must be considered if any

Fig. 11.—Plaster teeth of one side carefully cut away at gingival line and labial aspect of cast recessed. The penciled outline indicates the labial area to be trimmed. (After method advocated by Simonson.)

Fig. 12.—Three anterior teeth, both upper and lower, waxed in position and labial wax rims built to correct thickness and contour.

attempt is made to restore lost vertical dimension. The value of the restoration of vertical dimension of the face was first called to the attention of the profession by the late Dr. Monson, of St. Paul. It has been my opportunity to do research in anatomy and physiology, in which I am still engaged, attempting to determine the effect of the loss of vertical dimension on the anatomic structures of the mouth and throat. Neither time nor space permits me to go into the subject here, though it is my opinion that it is a most

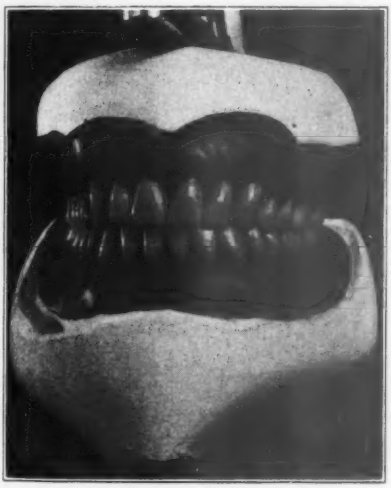


Fig. 13.—Set up of both upper and lower teeth and labial rims completed.

important consideration in any type of denture service. I shall illustrate with one case, which is not an immediate denture case. The patient came to me, Oct. 1, 1934, for two reasons: she could not use her lower denture and she had been advised by another patient that perhaps something could be done to help her hearing. The examination disclosed an upper denture that fit fairly well and a lower denture which was extremely loose because of a decided error in the placing of the denture borders. Both upper and lower ridges were favorable, and roentgen-ray examination of the edentulous ridges proved that they were free of pathologic areas or root tips. Both dentures contained heavy deposits of tartar, indicating crowding of the tongue and lack of drainage in the mouth. The integument of the face was deeply folded. Digital examination of the external auditory meatus disclosed a condylar displacement of such an extent that, in centric occlusion, the external auditory meatus was narrowed considerably. The patient was sent to an aurist for examination and an audiometer reading. The written report states that no pathologic condition was present and that there was a gradual loss of hearing, which would probably continue because of sclerosis of the joints between the malleus, stapes and incus of the middle ear. The audiometer report shows loss of hearing 56 per cent in the left ear and 57 per cent in the right ear. The dentures were constructed and inserted October 17. The vertical dimension increased from the base of the nose to the base of the chin from 59 to 72 mm., giving a vertical opening of 13 mm. The patient was again sent for an audiometer reading, and this time it revealed a loss of hearing of only 12 per cent in the left ear, and 16 per cent in the right ear. In order to determine how well the improvement in hearing would be maintained, an audiometer reading was taken again November 23, a little more than a month later. The reading at that time showed the left ear with a loss of 8 per cent; the right, a loss of 16 per cent. The restoration of the lost vertical dimension in this case was decidedly beneficial. Facial lines were restored, the hearing was brought back to normal, drainage in the mouth was improved to the point that no calculus

has gathered on either denture and the anatomic structures of the mouth and throat are again in their best position for proper physiologic function. Thus, the ultimate in esthetics is sacrificed for the more valuable benefits resulting to the patient by the restoration of lost vertical dimension and the restoration of the mandible to a position of muscular balance.

As I have stated, the immediate denture technic which I shall describe at this time is an adaptation of the full denture impression technic used in the construction of the case just illustrated. Therefore, the latter technic will be referred to constantly, particularly in the illustrations, to bring out more clearly the changes in procedure necessary because of the presence of the natural anterior teeth. To illustrate the steps in this technic, a practical case was used, unusual only because of the fact that both upper and lower immediate dentures were constructed and inserted at the same appointment. Only the upper technic will be gone into in detail. With but one or two minor exceptions, the principles and steps involved apply equally to the construction of the lower.

The patient (Fig. 1), in good general health, yet with hopelessly diseased teeth and investing tissues, owing to neglect to take the time to have his dental health maintained in the years when times were good and he was busy, and then being unable to because of economic reverses until driven to it by pain and discomfort, is a type which will be commonly seen in dentists' offices the longer the depression stays with us. Study models were made (Fig. 2), and examination revealed an end-to-end occlusion of the anterior teeth, with an estimated loss of 2 mm. of tooth structure, the upper and lower each showing a loss of 1 mm. This, then, indicated that loss of vertical dimension in this person was very small, and, in the construction, only this amount would be

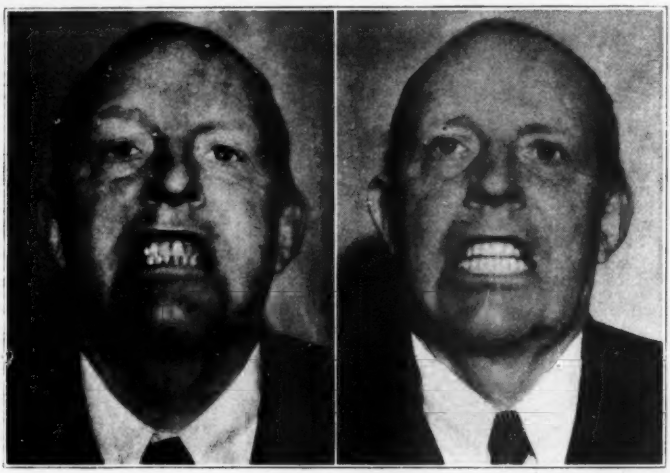


Fig. 14.—Appearance of patient with remaining teeth extracted, labial process prepared and completed dentures inserted. Left, patient with natural teeth present. Right, appearance of patient after insertion of upper and lower full dentures.

Fig. 15.—Profile view of patient (left) with natural teeth and (right) with immediate dentures inserted.

Fig. 16.—Appearance of patient (left) before and (right) after insertion of immediate upper full denture.

restored, which, after the necessary milling of the porcelain teeth accompanied by the settling of the dentures, would maintain the facial lines practically the same as with the natural dentition. The upper throat form, according to the House classification, was Class 1; the lower throat form, according to the Neil classification, was Class 3. Other conditions were found to be favorable and the next step was the selection of the tray.

SELECTION OF THE TRAY

The tray selected for the immediate

denture impression should be the type used ordinarily for impressions in those cases in which the teeth are present. Like the tray for the edentulous mouth, it should be long enough anteroposteriorly to include the soft tissue posterior to the tuberosity, overlying the hamular process of the sphenoid bone. It should be oversize to allow for approximately one-fourth inch thickness of compound at all points, particularly in the vault. It is necessary to straighten out the up-turned portion of the tray posterior to the tuberosity to allow for bulk of compound in that area of the impression. Britannia metal trays are preferable because of their rigidity and because they will not spring when pressure is applied to the center of the tray in impression taking.

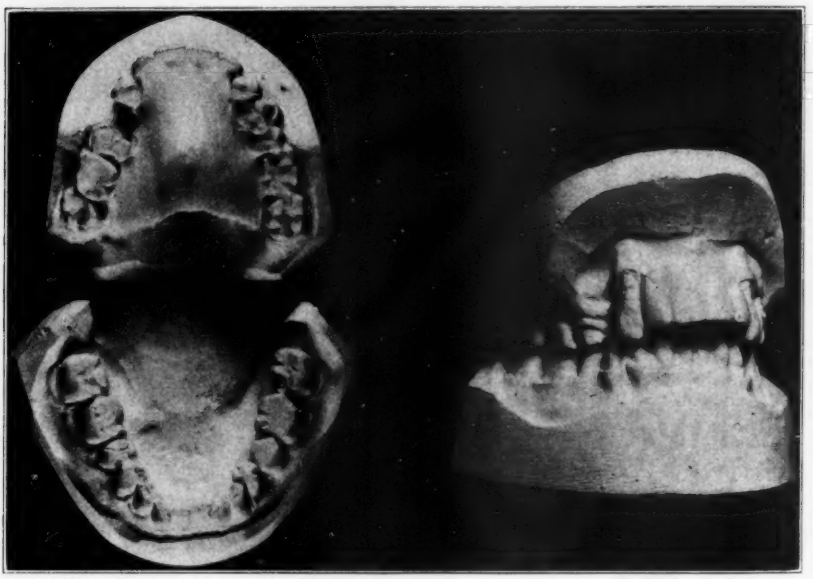


Fig. 17.—Study models of case shown in Figure 16.

TAKING THE IMPRESSION

Equal portions of red and black compound are softened at a temperature of 150 F. and mixed to a homogeneous mass of even color. A sufficient quantity is placed in the tray, partially molded, and inserted in the mouth. A continuous pressure of 10 to 15 pounds is exerted upward and backward, following the slant of the nose, the pressure being applied with the middle finger on the center of the tray, which equalizes the pressure exerted by the impression material. On removal, it should be examined not only for detail, but also for correct distribution of the compound (Fig. 3*A*). Faults occurring in the impression in the labial area of the natural teeth should be disregarded as that portion of the impression will be removed. If distribution of the compound is satisfactory, the excess along the borders is removed back to the height of convexity (Fig. 3*B*) and the impression removed from the metal tray. Care-

ful handling and frequent chilling from this point on will prevent distortion of the compound tray.

The labial portion of the impression from the distal aspect of the left remaining teeth to the distal aspect of the right remaining teeth is removed down to the incisal edge of the teeth. The impression can now be easily replaced in the patient's mouth, as the undercuts have been eliminated. The posterior portion of the impression is so trimmed as to allow at least one-fourth inch of excess length in the area of the posterior plate line. The mouth blow torch or similar small flame is then directed against the denture border on

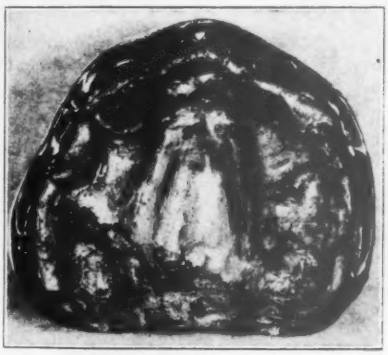


Fig. 18.—Completed upper impression in case shown in Figures 16-17, with posterior plate line grooved, hard area relieved and case boxed ready for pouring.

the buccal aspect from the tuberosity to the anterior border of that flange. It is tempered in water and placed in the patient's mouth, and the impression muscle trimmed on that side. This procedure is repeated until all the excess compound has been eliminated in the denture border (Fig. 3*C*). This border then is correct not only for height, but also for thickness of the denture allowable in that area. The process is repeated on the opposite side and the impression is then made ready for the plaster wash (Fig. 3*D*) by removing from one-sixteenth to one-eighth inch of compound overlying the hard area and over the posterior plate line and postdam area. The similarity of this to the regular full denture technic is shown in Figure 4.

Just before the plaster is prepared, the necessary markings are made with an indelible pencil in the roof of the mouth, indicating the size, shape and extent of the area to be relieved and also the posterior plate line from tuberosity to tuberosity. The compound tray is then coated with a regular mix of quick setting impression plaster, placed in position in the

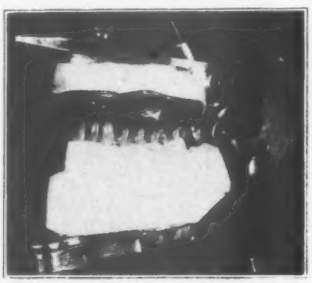


Fig. 19.—Completed set up of case shown in Figures 16-18.

patient's mouth just before the mix has begun to reach the setting point and firmly seated with the same pressure used when the compound impression was taken. The upper lip is then raised, and plaster is placed in the area in which compound has been removed and the lip brought gently down in position, muscle trimming being done as the plaster is setting. When the plaster is set thoroughly, the posterior portion composed of the compound tray is loosened slightly, and the anterior plaster sections are carefully removed. The posterior section is then easily removed and the parts as-

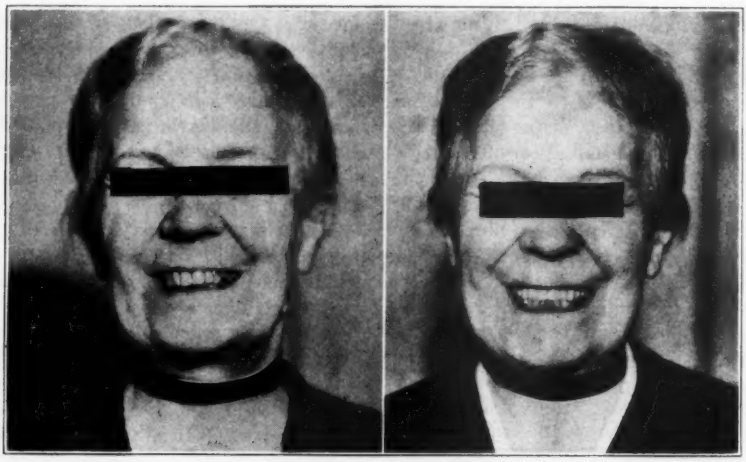


Fig. 20.—Case shown in Figures 16-19 completed. Left, appearance of patient with natural teeth and partial denture in position. Right, appearance of patient with immediate full denture inserted.

Fig. 21.—Profile views of patient shown in Figure 20, before and after insertion of immediate denture. The vertical dimension had been increased 7 mm.

sembled, a completed impression resulting (Fig. 5).

The necessary relief is then made by scraping away the plaster within the indelible outline indicating the presence of the hard area. With a sharp instrument, a groove is made along the line indicating the posterior plate line. The impression is then ready to be boxed up, the separating medium applied and the cast poured.

BUILDING THE TRIAL PLATES

After the cast is separated from the impression (Fig. 6*A*), it is trimmed and made ready for the building of the trial plates and the bite-rims. The posterior plate line shows distinctly on the cast, appearing as an embossed line as a result of the groove placed in the impression. The cast may be trimmed up to within 2 or 3 mm. of the embossed line. The trial plates are now constructed of trubase and wax (Fig. 7), a strengthener being employed for both upper and lower to prevent distortion from the heat of the mouth. The height of the bite-rims should be slightly more than the height of the natural teeth present to allow for proper positioning in taking the bite.

Fig. 22.—Appearance of patient (left) before and (right) after immediate denture service. The vertical dimension was increased 5 mm.

POSTDAMMING THE UPPER CAST

At the second appointment with the patient, the first step is the postdamming of the upper cast, which consists of placing a definite sealing pressure along the posterior plate line (Fig. 6*B*). The postdam should vary in width and amount of pressure exerted according to the resiliency of the underlying tissues. This procedure as I shall outline it calls for postdamming the case on the cast. Therefore, it is desirable that the impression be taken of this area with the tissues in rest position, which is the purpose of the plaster wash impression. If a straight compound technic is used, the principles enumerated are the same, though modified to the extent that the movable tissues are displaced by the pressure of the compound. In Figure 8, the posterior plate line has been divided into five equal areas, of which *I* and *V* are similar in that they lie between the tuberosity and the hamular process. *II* and *IV* are similar in that they lie between the median line area and the tuberosity area, and *III*, which is the median line area. Though *I* and *V* and *II* and *IV* are

similar, they vary in resiliency in the individual. A No. 10 round bur is used to cut into the cast along the embossed line which appears as the posterior plate line, and this groove is represented in the diagram (Fig. 8) as the space between the two dotted lines in the posterior part of the cast. A No. 10 round bur is used because it is exactly the width of the space available between the hamular process and the tuberosity. With the patient in the chair and the operator working in the mouth with a mouth mirror, the tissue in area *I* is compressed to the fullest extent. The amount of compression should be estimated in terms of millimeters and then cut into the cast two thirds of that depth. For example, if the amount of compression in area *I* is estimated to be 3 mm., a groove the depth of 2 mm. is cut into the cast. The same technic is applied to area *V*, and a groove cut accordingly, and in area *III*, in which we ordinarily find the smallest amount of compressible tissue because of the fact that the underlying tissue is made up of tendinous material, formed by the union of the levator veli palatini muscles. The procedure is repeated in area *II*, in which we ordinarily find the greatest amount of resilient tissue, and which, therefore, allows us to postdam to a greater extent. This is possible because the underlying tissue in this area is ordinarily the belly of the tensor veli palatini muscle as it passes forward from around the hamular process to be attached to the palate bone. When this depth has been determined.

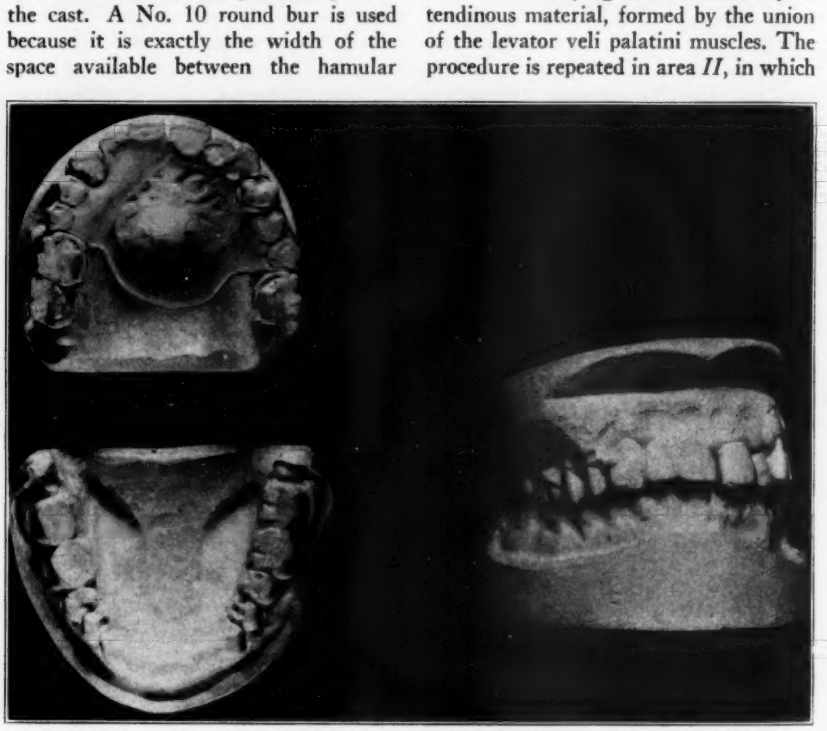


Fig. 23.—Study models of case shown in Figure 22.

the groove from areas *I* to *III* is made continuous in a sweeping curve. The same procedure is followed in area *IV* and the groove connected between areas *III* and *V*. We then have a groove the width of a No. 10 bur across the five areas of the posterior plate line as indicated (Fig. 8), which varies in depth according to the resiliency of the underlying tissue, but has not taken into consideration the width of the postdam that may be placed. Therefore, with a sharp knife, we widen the postdam in area *III* from the depth of the groove to the posterior border of the relieved hard area,

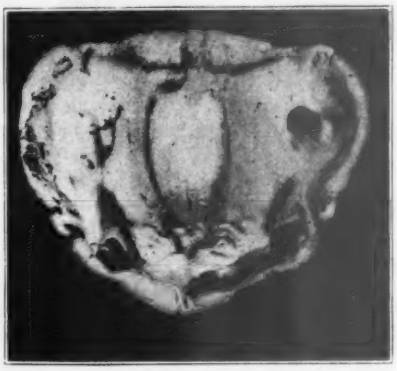


Fig. 24.—Completed impression for immediate upper full denture for case shown in Figures 22-23.

reducing the pressure anteriorly so that, at the anterior borders of the postdam pressure, the plaster is cut to a feather edge. In areas *II* and *IV*, we find that we can apply the greatest width of postdam pressure and should run anteriorly a depth of from 10 to 15 mm. Many operators urge that, instead of applying a postdam pressure to this particular area, relief is necessary because of the presence of the posterior palatine canal. The anatomic structure of this area as found in dissection has shown that the mucous membrane overlying this area reaches an average depth of from 15 to 20 mm. and that the blood vessels and nerves which emanate from this foramen run anteriorly in a bony groove which protects them for more than half their thickness, and therefore this area can stand postdam pressure rather than be relieved, and a more comfortable denture results. In areas I and V, the width of the postdam must be confined to the width of the No. 10 bur, therefore only that part of the cast being scraped away to reduce the sharp anterior edge of the groove. If the postdam pressure is widened out in this area anteriorly, pressure is exerted upon the thin mucous membrane overlying the posterior part of the tuberosity. We know that cellular atrophy results from this type of pressure; therefore, a shrinkage of tissue takes place, causing a leakage in that area of the denture. If the postdam is widened posteriorly so that pressure is brought to bear against the hamular process, a condition known as bursitis results because of the inflammation caused on the bursa of the tensor veli palatini as it turns around the hamular process. With this condition present, the patient undergoes sharp pains in the act of deglutition and the denture must necessarily be shortened at that point.

After the postdamming of the case has been completed, the bite-rims are corrected to the proper height so that they will occlude in centric occlusion. This step is greatly simplified in immediate denture technic because the guide to centric occlusion is present. If necessary for the articulator that you are using, a face-bow transfer should be made at this time. The selection of the teeth to be used should be made, and it is at this point that I feel the esthetics of the case should be discussed thoroughly with the patient.

Fig. 25.—Profile view of case shown in Figures 22-24, before (left) and after (right) immediate denture service.

Fig. 26.—Front view of case shown in Figures 22-25, with natural teeth (left) and with immediate upper full denture in place (right).

SETTING UP THE TEETH

In setting up the teeth for an immediate denture, I follow the procedure as outlined by Alfred W. Simonson, of Minneapolis. After the case is mounted upon the instrument (Fig. 9), the posterior teeth are first set up in occlusion (Fig. 10). After the posterior teeth are set to articulation and occlusion in the various mandibular ranges, the teeth may

be tried in if one wishes to verify the occlusion in the mouth. The next step is to cut away carefully at the gingiva the central, lateral and cuspid of one side (Fig. 11), recessing the plaster laterally from the median line to allow for the bulk of the necessary denture material for the labial rim. The amount of recession depends on the prominence of the upper teeth and the plaster should not extend more than two-thirds of the way up from the crest of the ridge. The advantage of the new denture materials, particularly the vinyl-resin group, is that they can be very thin as far as the labial rim is concerned. Therefore, when these materials are being used, the amount of recession of the plaster does not need to be very great. If vulcanite is used, the amount of resection of the plaster should be greater because it is almost impossible to construct a labial rim of vulcanite as thin as the materials mentioned. The three anterior teeth are now waxed in place (Fig. 12), keeping the position, if it is so desired, of the natural teeth. This can be done by referring to the study model. In waxing up, the labial rim is made to conform to the contour of the untouched portion of the model of the opposite side. Thus, the untouched side serves as a control factor for building up the exact form which has been taken away. The three plaster teeth of the opposite side are then cut off and the plaster is resected as previously described. The artificial teeth are placed in position (Fig. 13), and the labial rim is waxed up to harmonize with the portion of the opposite side. The anterior or labial rim is now complete, and with the exception of the borders of the denture serving as a peripheral seal, is practically of the same dimensions as the natural structures were before the extraction of the teeth. The waxing up of the case is then completed, and it is ready for flasking. The material to be used as the denture base is a matter of the operator's judgment. Several reports of studies made on the advantages and disadvantages of the new denture base materials have been given before the profession from time to time. The study is now being undertaken by the Bureau of Standards, and their report, which will be given before the Section on Full Denture Prosthesis at the coming meeting of the American Dental Association in New Orleans, will be awaited with a great deal of interest. My experience with the vinyl-resin materials has been satisfactory as far as color and performance is concerned, and I find them ideal for immediate denture work.

THE INSERTION OF THE FINISHED DENTURE

When the patient returns for the next appointment, the first step is the removal of the remaining natural teeth, and the preparation of the process for the denture. A local anesthetic is the one choice for this work. After the removal of the teeth, the average case requires only that the labial process be gently but firmly pressed lingually and the interdental septum be reduced by the use of a rongeur forceps and bone files on the labial aspect. The height of the lingual crest is not disturbed. The amount of plaster cut away on the cast, of course, determines the amount of labial septum which must be removed, but it is only in cases of extreme prominence of the upper anterior teeth that anything approaching the radical alveolectomy operation is used. The completed upper denture may be tried in frequently to determine when the labial process has been correctly prepared. Though I have never found occasion to use it, I feel that Victor H. Sears' technic in constructing a transparent celluloid base is probably a valuable one. The edges of the labial and lingual gum tissue

are freshened up and the denture is inserted and the patient instructed to leave it in place for forty-eight hours. The denture acts as a matrix and is a protection to the blood clot. When the patient returns for the next appointment, on removal of the denture, a healthy condition of the wound will be found. Sutures are never used, as the denture acts as a matrix and keeps the tissues in place. After the first forty-eight hours, the patient is instructed to remove the denture at least three times a day and to clean it and likewise to rinse the mouth with warm salt water or any good mouthwash.

Figures 14 and 15 show the case completed. Figures 16 to 26 are illustrations of two other completed cases, showing that the basic steps of the technic are unchanged regardless of the number of remaining anterior teeth.

Immediate denture service in my opinion is the ideal transition from natural to artificial dentures. The real secret of the success of this work is that it is an ambulatory treatment. The patient experiences no interference or hindrance in his ordinary daily routine, which is an economical advantage in many walks of life. He experiences so little change in facial appearance that business and casual acquaintances are seldom aware of the transition, and many times this has been true of intimate friends, even members of the family, unless they were told beforehand that such a change was contemplated. He experiences no waiting period for edentulous gums to heal, a mentally depressing interval in which he is a dental cripple, disfigured, self-conscious to the point of seclusion, bewildered by the loss of the occlusal stop between the jaws, and with the mandible actually in a degree of dislocation. Instead, he is a thankful patient, and voices his enthusiastic approval of the fact that dentistry has made it easy for him to go through one of the dreaded changes in his life. He becomes a booster for good dental care, and that is precisely what dentistry needs.

THE VALUE OF PHYSICAL STUDIES IN THE DIAGNOSIS AND TREATMENT OF LESIONS OF THE MOUTH*

By LEROY M. S. MINER, M.D., D.M.D., D.S., Boston, Mass.

THE history of dentistry as a profession is short and, for most of its brief course, its aims and purposes have been confined to the field of mechanical and surgical therapy. With the growth of new knowledge, which increases every day, it is coming to be realized that many of the problems now facing dentistry lie directly in the field of general medicine. Even though one believes that dentistry can best develop quite independently of medicine, it can hardly be denied that the dentistry of today is one of the subdivisions of the healing art, occupying in practice a relation to the main body of medicine essentially like that of otology, laryngology and ophthalmology, and like these, springs from the main trunk of general medical knowledge and experience.

*Read before the Section on Oral Surgery, Exodontia and Anesthesia at the Seventy-Sixth Annual Session of the American Dental Association, St. Paul, Minn., Aug. 8, 1934.

There is one difference between dentistry and other specialties of medicine which is of far-reaching importance—a difference which the late William Sidney Thayer, of Johns Hopkins University, one of the most distinguished medical authorities of our time, has pointed out. He says:

> The ophthalmologist and the physician meet on common ground; they are members of the same medical societies. Their subjects are discussed at common meetings. The dentist and the physician do not meet on the same common ground. This is unfortunate for the physicians, for the dentist and for the patient.

This lack of community interest between dentistry and medicine has been unfortunate because dentistry has failed to make adequate use of basic knowledge and experience. In fact, for a time, it has tended to develop its own specialized interests to the point where it ceases to be interested in the patient as a biologic unit, concentrating its attention on that circumscribed part which we call the oral cavity. The extent to which this contraction of interest and attention has developed is illustrated by the attitude of a very capable dentist who has been heard to argue quite earnestly that the mouth has its own laws of pathology and bacteriology, which are entirely distinct and different from those in effect in the rest of the body.

THE BODY A BIOLOGIC UNIT

We need not dwell on the folly of such an exaggeration of the specialist's point of view, but it is fair to remind ourselves that it is a very widespread evil.

No one has better stated the underlying principle on which healthy progress in dentistry depends than Paul R. Stillman, who says:

> The fields of medicine and dentistry have been segregated by law, but the human body, notwithstanding the laws of the state, remains a biologic unit and its functions and needs are subject only to the laws of nature.

It is possible to make legal division of the body, but Nature knows none. Her consent has not been given. No legal barrier can stop the toxins from an infected tooth spreading to the heart and interfering with its action, or to the joints and initiating arthritis or to the eye and affecting vision; or, conversely, prevent a dysfunctioning heart affecting unfavorably other structures of the body, including the tissues of the mouth.

UNITY EMPHASIZED IN RESEARCH

If any of us needed to be convinced of this; if any one were seriously in doubt about the interdependence of parts, organs and functions of the body, he could speedily be assured by observing dental research in any of our universities. Nowhere is the unity of the body more evident, each part depending on the other, than in the field of research. Nowhere is cooperative exchange more imperative than here. When one begins to study seriously any important dental problem, the crossing of lines of technical and scientific knowledge immediately becomes necessary, to the point where one can with complete justification doubt that there is any such thing as dental research *per se*.

What is true in the laboratory is equally true in everyday practice. The unity of the body demands unity of theory and cooperation in dealing with the patient.

RESISTANCE AGAINST ISOLATION

Truth made obvious by experience in the field of research is no less plain in the daily practice of the profession. To give effective service to the patient, and hence to the community, dentistry must be able

to draw on all the resources of the healing art. It must not permit itself to take or to fall into an isolated position or to become merely a technical branch of surgery. It must resist every tendency in this direction by broadening its base of knowledge and by extending its relations of interchange and cooperation to include every branch of medicine. The effect that varying conditions of health has on the hard and soft tissues of the mouth and the changes that result therefrom have not received the attention that they deserve, in either the diagnosis or the treatment of oral lesions. Their recurrence and their prevention, which is of even greater importance, are also concerned in this problem.

The more constant and complete the cooperation of the dentist with practitioners of other branches of the healing art, the more effective the service rendered the patient and the greater the satisfaction to the dentist. "That may be all right in theory—but how does it work out in practice?" I can hear someone objecting. The answer to that question is the chief concern of this paper.

GENERAL PHYSICAL DIAGNOSIS A NECESSARY PRELIMINARY

First, let me say that I am strongly of the opinion that no one can accurately diagnose and effectively treat diseases of the mouth without knowing something about the patient as a whole. To gain this information, it is important to make such physical studies as will give some idea of how the body as a whole is functioning.

A Case in Point.—A group of students were studying a case to determine the diagnosis and to outline the treatment. The patient was a thin, anemic looking girl of 18, obviously underweight and poorly nourished. Examination of the mouth disclosed the fact that the gums were inflamed. Several broken-down roots were present, many teeth were carious and several teeth were missing. After the group had examined the case, one of the students was asked to discuss it. He outlined the diagnosis of the oral condition and then suggested the treatment, which included treatment of the gums, extraction of the roots, filling of carious teeth and restoration of the missing teeth with dentures—all entirely correct from the standpoint of the local problem. But nothing was said about the desirability of learning the physical history. There was no interest in the state of nutrition, the condition of the blood or the underweight; no curiosity regarding the reason for the multiple caries nor the possibility of preventing a recurrence. No question was raised as to whether the condition of the mouth was the cause or the effect of the obvious physical disability. In other words, there was no interest in the fundamental problem: the health of the girl and the relation of her dental problem to her physical condition.

Until the health of the patient is the objective of dental service, the sphere of usefulness and influence of the dentist is bound to be restricted and he will not be accepted on the same plane as the other specialists in the healing art.

OPERATIVE DENTISTRY

Practitioners who are primarily interested in the field of operative dentistry will naturally inquire as to how physical studies concern them. It is a natural question, but one not difficult to answer. The dentist should become concerned with this problem on the appearance of the first tooth in a child and, if possible, even go back to the expectant mother; for we know that the physical condition of the child, particularly the state of its nutrition, bears a very definite relationship to the quality of tooth structure and its resistance or susceptibility to caries. Those dentists who number children among their patients will place themselves in a position to render the highest

type of dental service by cooperating closely with the pediatricians.

How easy it is to be concerned purely with the disease within the mouth is illustrated by the following case.

A Case in Point.—A child, aged 10 months, who, up to the age of 7 months, had been well and strong, was brought to my attention. It had been breast fed up to that period. From the seventh to the tenth month, there had been trouble with the feeding. The child had developed a general irritability, and among other signs of an unsatisfactory condition were increasing inflammation and soreness of the gums. At this time, the mother took the child to the dentist and a mouth wash, which had proved ineffective, was prescribed. The dentist had looked only in the mouth and had made no attempt to learn anything about the related conditions. The history, of course, was significant, and this, coupled with a very simple examination including palpation of the shin bones, which proved to be exceedingly tender, justified the diagnosis of infantile scurvy. The child reacted promptly to antiscorbutic treatment.

THE PULPLESS TOOTH

Among adults, the condition which, from the point of view of operative dentistry, most fully warrants a fairly thorough evaluation of the patient's physical condition is that of the pulpless tooth. When it comes to the question as to whether a tooth should receive root canal treatment, the decision should not rest alone on the purely dental condition, but on the physical condition as well.

In the clinic at the Harvard Dental School, we have made an attempt in this field to determine the susceptibility index which is based to a considerable extent on the history. The chief complaints are recorded and direct questions are asked regarding those diseases which are referable to infection, particularly arthritis, neuritis and cystitis. This would indicate his own or an inherited susceptibility. Then the positive aspect of the picture is investigated, the resistance, included in which are the occupation, home conditions, grief, worry, fear, innate habits and nutrition. As a third check, the presence of foci other than teeth is studied: the tonsils, throat, ears and adenoids; auto-intoxication; etc. On the basis of this inquiry, a susceptibility index may be rather roughly determined, and if this brings to light anything of significance, a more complete physical examination is made.

With this study, an approximation of the physical condition may be made which will determine whether the patient is able to carry a tooth that has been treated. This is entirely aside from the question of the condition of the tooth itself. Again, with adults, we sometimes find recurrent and rapidly spreading caries, particularly at the cervical margin, which, from a local and operative point of view, becomes a serious matter. The condition frequently is symptomatic, a reflection of the patient's general condition. It is not uncommonly seen in women at the menopause, and outlines for treatment may be decidedly influenced by the physical study.

A Case in Point.—Such a case was that of a woman who was suffering severely from highly sensitized cervical caries, which was quite general. The condition was controlled within four months by adequate attention to her physical condition, a change in nutrition and the building up of the resistance generally.

This type of service is, of course, greatly appreciated by the patient, and it is a great satisfaction to the dentist to be able to control, by general measures, what it is almost impossible to control by local treatment.

PERIDENTAL DISEASE

When it comes to lesions of the soft

tissues, particularly the peridental type, in which the periodontist is interested, we have one of the most fertile fields for physical studies from the standpoint not only of diagnosis but of treatment as well.

I have repeatedly insisted that the soft tissues of the mouth are a barometer of the patient's physical condition and will respond to changes in the general health of the patient. In beginning the treatment of any case of peridental disease, it is of the greatest importance that a thorough checkup of the physical condition be made.

A Case in Point.—A dentist, a friend of mine, met me on the street some little time ago and talked with me about a case of peridental disease which was puzzling him. The treatment that had been successful in many of his cases did not bring the slightest response in this one. When asked what sort of treatment I would recommend, I inquired as to whether he knew anything about the physical condition. His reply was in the negative. I suggested a checkup of the physical condition, including a urine and blood test, venturing the guess that a kidney or diabetic condition might be present which was interfering with the local treatment. Several days later, he met me on the street and said that the patient had had a physical checkup; that sugar had been found in the urine and there was an increase in the blood sugar, which explained his lack of success in the management of the case. Proper diet for the diabetic condition was given and the gums began to respond almost immediately.

Determination of what Harold K. Box calls the "basic states" is of considerable importance in the management of these peridental conditions. Willman has listed under the general causes of peridental disease: arthritis, cancerous conditions, pregnancy, menopause, arteriosclerosis and certain nervous infections. All these, he says, cause a humoral imbalance and trophic disturbances of the alveolar bone. If these statements are true, and I think few would deny it, it becomes important to secure these facts before beginning treatment in a given case. The procedure and the prognosis will both be influenced materially by the information thus gained of the physical state and the relation of that physical state to the disease in the mouth.

ORTHODONTIA

In orthodontia, where normal growth and development of the jaws and face is in direct relation to the well being of the body as a whole, knowledge of the physical history and condition is fundamental to intelligent management of a case.

ORAL SURGERY

In both the diagnosis and the treatment of lesions which come to the attention of the oral surgeon, physical studies are often illuminating. Certain lesions which appear to be purely local may be reflections of deeper seated conditions.

Cases in Point.—Two cases of what appeared to be a simple epulis proved later to be the result of changes which arise in hyperparathyroidism and were a part of the condition of osteitis fibrosa cystica. In another case, a man of 48 came in complaining of severe pain centering in the right central incisor and radiating from there over the canine fossa. There was some swelling of the gum and the tooth was tender and slightly loose. Pain was not relieved by extraction of the tooth. The maxillary sinus was explored and found to be normal. In a discussion of the physical condition, the fact came to light that for a month he had been sexually impotent. A physical check-up revealed among other things an absence of the knee jerk. A provisional diagnosis of brain tumor, was confirmed at operation.

ANESTHESIA

One of the problems of treatment of surgical lesions of the mouth is the selec-

tion of the anesthesia. This is naturally determined in large measure by the physical condition of the patient. It is a sound rule that no general anesthetic should be given without assurance that there are no physical contraindications; and yet that rule is often broken.

A woman of 65 came to one of the clinics in which I am interested, to have a number of teeth removed. Nitrous oxide and oxygen was to be administered. Just before the operation, I asked the operator in charge what he knew about the patient's condition. He had assumed that it was normal, but it proved that there was a cardiorenal syndrome and an arteriosclerosis, with a systolic blood pressure of 230. While nothing might have happened, the possibilities of trouble made nitrous oxide anesthesia hazardous.

THE DENTIST'S POINT OF VIEW

These are some of the problems which present themselves to the dentist, which come before him in his practice—cases of periodontia, orthodontia, oral surgery and operative dentistry. What is the point of view from which he is to regard them? Certainly not that of the general physician. Nor is he expected to take the rôle of the internist, the diagnostician or the heart specialist. He need not cross the boundary of his proper field. How then shall he proceed?

First, by intimate cooperation with the physician, who will furnish him the necessary reports of examinations, which must, in turn, be interpreted and related to the dental problem by the dentist himself. Secondly, by cultivating the habit of keen observation supplemented by pertinent questioning of his patients. Thus the dentist can train himself to get a very considerable amount of information. This amounts to a sort of medical detective work, which constantly adds zest to the routine of practice and makes it unnecessary to lean too heavily on medical colleagues.

CASE HISTORIES

In developing a case history, there is a more or less standard procedure which the dentist may follow and thereby bring to light facts which have an important bearing on the case being studied. The headings under which this information may be organized are: 1. The General Facts. 2. The Family History. 3. The Past History. 4. The History of the Present Illness.

The general facts, which include race, age, sex, occupation and weight, serve to appraise the patient from the standpoint of what might be called health or disease tendencies. Certain races are predisposed to particular diseases, the negro to rickets, for example. It is undoubtedly true that environment and habits, especially those affecting diet, determine to some extent the disease reactions peculiar to a given race. Age likewise brings its chain of tendencies, which must not be overlooked in studying any dental case. The same is true of sex, since structural and physiologic differences in the two sexes naturally offer their peculiar problems. Occupation, once a powerful factor in bringing about ailments of certain types, has less significance than formerly since the public health services are constantly guarding the industrial workers against occupational disease.

Organizations interested in physical standards, particularly insurance companies, have compiled statistics establishing normal weights for different ages and heights. The study of people *en masse* is different from the study of an individual case, and it is true that a person may be somewhat above or below the normal average for age and height and still be in good health; yet any marked variation from normal or any sudden loss

or gain in weight should stimulate investigation.

THE FAMILY HISTORY

Heredity in its relation to disease is still a somewhat moot question, but that certain diseases, such as malignancy and insanity, occur frequently in certain families is a common observation. Certainly the family history should not be disregarded. Material assistance may be obtained from it, as witness the following case that appeared in the surgical clinic of the Harvard Dental School.

A man, aged 52, single, presented an atypical swelling in the submaxillary region. Roentgenograms of teeth and mandible were negative. The family history revealed the fact that the patient had two brothers and one sister. The sister had had one breast removed for carcinoma. One brother had been operated on for carcinoma of the rectum and had died from this disease.

A preoperative diagnosis of carcinoma of the submaxillary gland was made, largely on the basis of the family history. Diagnosis was confirmed at operation by microscopic examination.

PAST HISTORY

The following case illustrates how valuable a past history may be, even in a supposedly simple dental condition.

A white woman, aged 36, married, but with no children, came to the clinic for treatment of a small discharging sinus of the palate opposite the first molar tooth. The tooth, which was heavily filled, was tender and slightly sore to percussion. Tests for vitality were negative. Roentgenograms revealed a definite area of absorption of the bone over the roots. Diagnosis was made of chronic abscess of the first molar and extraction was advised, with the assurance that relief should be prompt. The patient reported again in about four weeks. The tooth socket had practically healed, but the sinus was still discharging pus. At this time, a full case history was taken, as should have been done on the first visit. No information of special importance was obtained until the patient remembered that, a few years previously her hair fell out and she had an eruption on the skin, with considerable trouble in her throat; also, she "felt poorly." Her physician had then given her some drops to take in water, three times a day. This clue led to a tentative diagnosis of syphilis, which was later confirmed. Instead of a simple abscess, we had a case of tertiary syphilis.

The fact that patients who have had acute inflammatory rheumatism, scarlet fever or other diseases are likely to suffer from the customary sequelae should always be borne in mind.

PRESENT ILLNESS

Before an examination of the patient is made, there should be careful questioning, to bring out all that may be of importance. Pressure of time sometimes tends to discourage this, but usually it will be time well spent.

I have tried to show that the dentist may conduct his own search for information regarding the patient's physical status as far as it can be obtained through the history of the case. When it comes to the physical examination, I have already indicated that the dentist should not invade the field of the physician. On the other hand, the dentist may record certain observations which will help in forming an opinion of the patient's physical condition. There are facial signs in which the dentist should be interested and the significance of which he should be able to appreciate. The color, for example, should be carefully noted. Pallor, blueness or undue ruddiness should arouse suspicion. Diseased adenoids are significant. Exophthalmic goiter, tuberculosis, alcoholism, etc., cause certain changes in facial contour and expression. These facies immediately put us on our guard. Again, the type of the individual may

have a bearing on the method of management of the case. The nervous type may need to be dealt with in a manner totally different from that suitable with the phlegmatic type.

There are numerous other aspects of a physical examination which may come within the scope of the dentist, such as condition of the eyes, the possible presence of the arcus senilis suggesting the probability of senile changes in other tissues. All these examinations and observations may be made without the patient's being especially aware that he is being minutely scrutinized. If dentists quite generally would take the time to follow their cases as I have outlined, modifying the procedure to fit their individual needs, not only would we soon accumulate more knowledge of our problems, but also we should serve the public much more effectively and win more secure recognition as a branch of the healing art.

HYPERPARATHYROIDISM, A NEW CONSIDERATION FOR THE DENTIST*

By JOSEPH F. BORG, M.D., St. Paul, Minn.

NOT infrequently, and certainly not always to the patient's advantage, the dentist is given the opportunity to see systemic disease the first symptoms of which are referable to the mouth. Usually, other symptoms of insidious onset have been present previously, such as weakness and malaise, but often local mouth symptoms, such as hemorrhage, pyorrhea, trench mouth or pain or swelling in the jaw, will bring the patient first to the dentist. Here, when the dental adviser recognizes the condition as having more than local significance, advice is frequently given concerning attention to the general health. Also not unusual in the experience of many dentists is the patient who comes in with the complaint of arthritis, neuralgia or neuritis or an indefinite complaint which he or she hopes arises from the teeth as foci of infection. With such responsibility placed on him, the dentist will usually study the condition of the teeth, and occasionally the roentgen ray films will, when carefully examined, present evidences of bony abnormality in the maxilla or the mandible. This opportunity for the early visualization of bone change will be used to advantage by the careful worker, who will call his patient's attention to the necessity for further study.

The failure to recognize early bone changes by the man given the first opportunity to do so was not of serious import to the patient when nothing was known about the majority of these conditions, and no therapy of value was available for any of them. The discovery in recent years of the etiology and pathogenesis of hyperparathyroidism, and the resulting response to surgical treatment of this condition, formerly recognized as osteitis fibrosa cystica, has made more important an understanding of this disease. The recent establishment of hyperparathyroidism as due to the decalcifying

*Read at the Sixteenth Annual Meeting of the American Society of Oral Surgeons and Exodontists, St. Paul, Minn., Aug. 3, 1934.

effects of an excess internal secretion of the parathyroid gland has marked a valuable addition to our knowledge of the endocrine glands, an understanding of which can now be of great service to those so afflicted.

The rapidly increasing case reports in the literature on the condition, at first considered rare, bear testimony to the considerable number of cases of this condition that are to be found when knowledge of the disease is disseminated through the profession. When it is known that many of the patients have been rendered edentulous by the time the diagnosis is established, it seems not unreasonable to believe that the opportunity for earlier diagnosis has been overlooked by men not alert to the probable significance of bony abnormality in the jaws as seen by roentgenogram. It is therefore timely to bring to the attention of the dentist a condition in which collaboration with the physician may be of great service not only in reducing the disability incident to a long standing, disabling disease, but also in pointing the way to its cure.

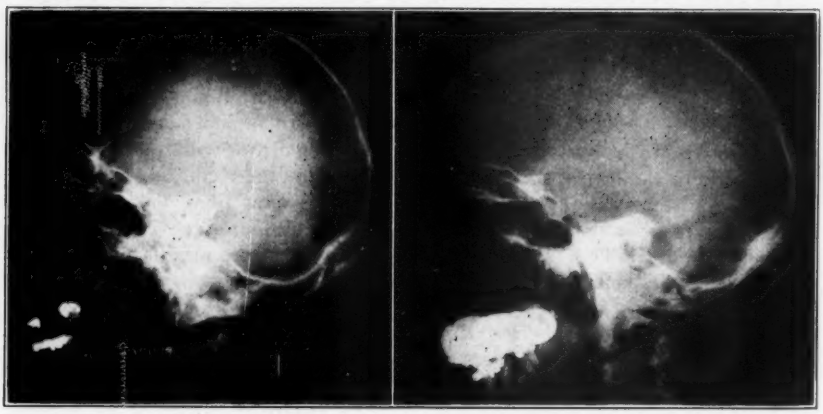


Fig. 1.—Left, cranium showing mottled appearance and thickening of tables before operation. Right, marked restoration of bony structure and normal appearing tables.

CLINICAL PICTURE

Hyperparathyroidism is caused by the presence of a hypersecreting adenoma of the parathyroid gland. The increase in secretion of the parathyroid hormone produces a typical clinical picture by its effects on the metabolism of calcium. Normally, this secretion regulates in some way the absorption of calcium from the alimentary canal and its storage in the bones for general body metabolism. In increased quantities, this hormone withdraws calcium from the bony storehouses, causing a general decalcification, a resulting increase in the level of calcium in the blood stream and a marked increase in the calcium excreted in the urine. This process develops slowly, usually going on for a number of years before its nature is determined, with a group of symptoms caused by the hypercalcemia and the bone changes produced by the decalcification. As the condition

develops insidiously, the only complaints, for some time, may be loss of strength and fatigability. These symptoms, which may be associated with a loss of weight, are due to the general effect of the increase in the level of calcium in the blood, and the decrease in the level of phosphorus. Associated may be a marked thirst, with increase in fluid intake and a marked increase in urine excretion, especially in the bones themselves. This becomes more or less constant and is aggravated by exertion and relieved by rest. At times, the patients feel that the joints are involved, and complain that the trouble is neuritis, arthritis or muscular rheumatism. These symptoms, if not the earlier ones, often send the patients, either on their own initiative or through their physician, to the dentist

Fig. 2.—Left, left radius and ulna, showing marked decalcification and cystic formation. Center, same region six weeks postoperatively, showing marked restoration of calcium. Right, same region five months later, showing return of bones to normal.

caused by the efforts of the kidneys to eliminate the increased calcium. These early symptoms may vary considerably, and even though medical care is sought, attention is not usually directed to the true disturbance. Later, one of the most common symptoms appears, pain in the extremities, chiefly in the legs and to eliminate the teeth as foci of infection, the condition simulating the general effects of a low-grade inflammatory process.

Careful roentgen-ray studies made at this time will probably show some bony change in hyperparathyroidism, and it is here that the dentist's advice may have

great value. The bony changes may be associated with a resorption of the alveolar margins, confirmed by roentgenogram, and are probably often accompanied by gingival infection, which the dentist may be inclined to consider the cause instead of the effect. Careful study of the roentgenograms of the mouth made at this time should reveal definitely recognizable abnormality. This may be early or it may be rather well advanced. Sometimes, bony tumors are first discovered in the jaws, and they may be among the earliest signs of the condition. They have usually been considered as indicative of local bone disease, and even on microscopic section have been called sarcoma, osteoclastoma, localized fibrocystic disease, epulis, bone cysts or dental cysts.

Later, the symptoms increase in severity. Renal calculi may form from the excess excretion of calcium in the urine. Gastro-intestinal symptoms may supervene. As the decalcification progresses, the bones become so weak that patho-

Fig. 3.—Right, tibiae and fibulae before operation. Left, marked increase in calcium postoperatively.

logic fracture occurs from slight trauma, bony deformities appear and the patient may become bedridden. If not treated, the patient slowly wastes away, and dies after a long illness.

The diagnosis of hyperparathyroidism is made on the basis of studies of the metabolism of calcium and phosphorus. These are quite characteristic, showing an increase of blood calcium excretion, on a known calcium diet. They are diagnostic, the symptoms occurring in no other known condition. An investigation of these findings is very important where-

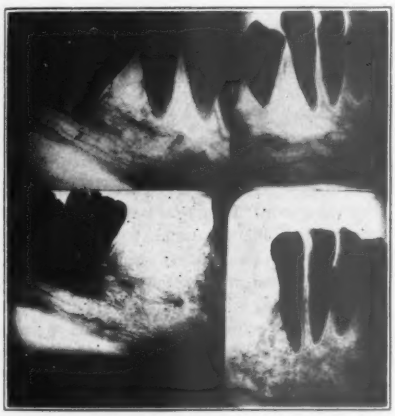


Fig. 4.—Above, areas of left mandible showing marked decalcification. Below, same areas showing several teeth removed and marked increase in calcium content of mandible.

ever a suspicion of hyperparathyroidism presents itself, especially since the present improved knowledge of the clinical picture of this disease makes it possible to suspect and diagnose it earlier. In the great majority of cases reported, suspicion was focused on the parathyroid glands only after pathologic fractures or the development of bone pain and swelling occurred, or after any condition which made roentgen-ray study of the bones advisable. Once generalized, bone and calcium metabolism studies are considered a possible aid in diagnosis, the attention of the investigator is centered on them, and they will establish the diagnosis. The surgical removal of the offending tumor will bring about a striking improvement in the patient's condition.

PATHOLOGY

The pathologic picture in hyperparathyroidism is seen predominantly in the skeletal system and in the tumor which arises from a parathyroid gland. It develops over a period of years, influenced by the basic or acid reaction of the diet, the age, the degree of activity of the tumor, the duration of the disease prior to study and the effects of pathologic fractures and certain complications such as pregnancy. The earliest bony change is the microscopic evidence of bone resorption by osteoclasts in enlarged haversian canals, with a replacement by connective tissue. At this stage, the marrow cavity is unchanged. This is a real osteoporosis, differing from the senile osteoporosis, and producing the clinical complaints. Later, the osteoclasts may form giant-cell tumors, and hemorrhage may occur, involving the marrow as well. Secondary to this, degeneration into cysts may occur. These may be quite large and distend the thinned cortex, producing the macroscopic bone deformity, with expansion and curving. While the early changes are generalized, the later ones may be exhibited most markedly in certain areas, such as the long bones, spine, skull and jaw. Jaffe's studies show that bone resorption is most pronounced where the most rapid growth takes place. The diaphyses are most involved, in contradistinction to the epiphyses in rickets. The marrow is replaced by fibrous tis-

sue, in which there is a redeposition of new bone, a process going on throughout the bone at the same time that decalcification takes place. At the bone ends, changes are chiefly resorptive. The tendency to decalcification exceeds the tendency to new bone formation, a condition quite the opposite to that in Paget's disease. The giant-cell tumor resembles histologically an epulis, except that the latter has a tendency to occur at the epiphyses. Changes in different bones vary somewhat in character. A description of these changes is excellently presented by Jaffe.[1]

The parathyroid tumor is a solid mass of cells arising from the parathyroid gland, often replacing the entire gland structure. It may be found in the normal position of a parathyroid gland, or it may be located anywhere in the neck or even in the upper mediastinum. It varies in size from that of a bean to that of an egg and is often subject to cystic degeneration, the cysts being filled with a brownish fluid. Owing to its variability of location, it is not always easy to find, but a careful search on the part of the surgeon will demonstrate its presence.

ROENTGENOGRAMS

From the standpoint of the dentist, the roentgenogram which he routinely uses will often be the means of directing his attention to bony abnormality. This picture will vary considerably with the stage of the disease. It varies also in its manifestations in different bones of the body, although all are involved. Early in the disease, the decalcification shows itself in a loss of distinctness of the original bone trabeculae, with a thinning of the cortex, a generalized osteoporosis. Later, with the redeposition of new bone, the area becomes granular and mottled. The development of giant-cell tumors and cysts is noted in the roentgenograms. They may push out the thin cortex, causing tumor formation in the bone simulating the single bone cysts of unknown origin found in various parts of the skeleton. Such a tumor has occasionally been diagnosed as an epulis. A process of decalcification with an attempt at bone repair is the dominant note in the roentgen-ray picture, and any suspiciously similar lesion in any bone demands a further and more extensive study of the skeleton.

The following case, to be published in detail in the medical literature, is presented in its essentials to illustrate this condition.

REPORT OF CASE

A. J., aged 30, a stenographer, referred by E. G. Sterner of St. Paul, in May 1933, with the exception of several unrelated illnesses from which she completely recovered, was well until two years previously. At this time, she began to be easily fatigued, to lose weight and to become irritable. This continued until the fall of 1932, when she began to have pains in the legs and weakness of the leg muscles. Thinking that she had some focus of infection causing her pains, in January, 1934, she consulted her dentist, V. W. Dedon of St. Paul, who discovered an extensive pyorrhea and, on roentgen-ray examination of the jaw, noted a decalcifying condition of the bones which he felt was due to some general osseus disease. He advised further investigation. The condition of the teeth apparently justifying removal, this was done. At the time, looseness of the teeth, which felt as though they were set in rubber, was noted. This condition in the jaw was so marked that when one of the teeth was extracted, a piece of the maxilla with an adjacent tooth came away. Healing proceeded normally, and nothing further was done until May, 1933, when the patient sustained a fracture of the left radius from a trivial blow. Roentgen-ray examination

1. Jaffe, H. L.: Arch. Path., 16:63 (July) 1933.

of the fracture revealed a marked "moth eaten" decalcification of the bones of the forearm and the patient was referred to me for study.

On admission to Ancker Hospital, St. Paul, general roentgen-ray examination of the skeletal system revealed a far advanced decalcification and cyst or giant-cell tumor formation throughout the entire skeleton, very suggestive of hyperparathyroidism. This diagnosis was confirmed by studies of the calcium metabolism while the patient was under observation, the blood calcium being markedly elevated, the blood phosphorus decreased and calcium excretion in the urine markedly increased. This condition was complicated by a hyperthyroidism, which was discovered while the patient was under observation. At operation, July 21, 1933, A. R. Colvin, St. Paul, found a firm cystic tumor about the size of a walnut situated in the upper mediastinum. This was removed and a partial thyroidectomy was also performed. The patient made an uneventful recovery, gaining rapidly in weight and strength. Early restoration of bone was seen in frequent roentgenograms. Within a few months, the patient was completely restored to health, feeling better than in years, and returned to her previous occupation.

DIFFERENTIAL DIAGNOSIS

Hyperparathyroidism is most often confused with osteomalacia. These conditions occur in several forms. True osteomalacia is very rare in this country. It is due to a vitamin D deficiency and responds to cod liver oil therapy. It is characterized by decalcification without fibrous tissue replacement, with infrequent osteoclasts and a congested lymphoid marrow. The blood calcium is low and cysts or tumors of the bones do not appear. Similar decalcification is observed in starvation and in certain endocrine disturbances such as hyperparathyroidism and basophilic adenoma of the pituitary gland. More common is the senile osteoporosis due to failure of new bone formation while the normal bone resorption goes on.

Early rickets will not be easily mistaken for hyperparathyroidism. Late rickets produces a widening of the metaphyses, seen roentgenologically, but calcium metabolic studies will differentiate it. Paget's disease may be confusing, but the difference in the roentgenograms when the skeletal system is studied, and the normal calcium metabolism, serve to exclude it.

Certain cases of "fibrocystic disease" of unknown origin, single or multiple giant-cell tumors and single unilocular or multilocular cysts may cause confusion. In all of these conditions, the diagnosis can be definitely determined by calcium metabolic studies.

COMMENT

The present case illustrates vividly the opportunity which the dentist may early have to call attention to the presence of generalized bone disease. Unfortunately, unless the attention of the physician is called directly to some conditions of the teeth or jaw, it is not unlikely that they may be overlooked in cases which are reported. This may account for the lack of description of this part of the body in many of the cases reported. The histories of a number of reported cases call attention to the fact that involvement of the jaw may early produce symptoms and signs which cause the patient to seek medical advice.

Barr and others[2] report the case of a man, aged 57, with a history of muscular weakness, in whom, after the removal of a tooth, a tumor developed at its site. There was also reported a general loosening of the teeth. After operation, this

2. Barr, D. P., and Bulger, H. A.: Am. J. Med. Sc., 179:449 (April) 1930.

tumor decreased in size and the teeth were more firmly embedded.

Wilder[3] reported a patient subject to marked dental caries, who developed a tumor at the base of the lower right bicuspid. This was operated on and microscopically diagnosed a sarcoma. Numerous teeth were removed on account of caries. The patient developed other bone deformities and, five years later, the diagnosis of hyperparathyroidism was established and a tumor found at operation.

Cohen and Kelly[4] report the case of a woman, aged 48, who had had a swelling of the jaw for eight years, and later developed leg pains and renal stones. Further study, followed by the removal of a parathyroid tumor, established the condition as due to hyperparathyroidism.

Keynes and Taylor[5] have described the case of a man, aged 25, who for seven years had had renal calculi and abdominal pains. For five years, he had had a diffuse swelling of the right maxillary alveolar process. Biopsy revealed an osteoclastoma with multinucleated giant cells. Later investigation showed all of the complaints to be due to hyperparathyroidism, and marked improvement followed the surgical removal of a parathyroid tumor.

Mimpriss and Butler[6] report the case of a boy, aged 17, of stunted growth, thought probably rachitic. He was first seen with a small red tumor protruding from the gum in front of the lower right bicuspid tooth. This gradually enlarged and, two months later, another, similar tumor appeared near the first lower left molar. Roentgen-ray study revealed a cystic bone change in the mandible, and biopsy of the tumor revealed an osteoclastoma. Further study led to the diagnosis and removal of a parathyroid tumor, with recovery.

Compere[7] reports the case of a woman, aged 59, who from infancy had never been well and who had in early life marked dental caries, necessitating early extraction of all teeth. Some relation of this condition to a parathyroid tumor removed surgically is possible.

In Rosedale's[8] case, in a woman, aged 50, a periapical tooth infection developed at the age of 27, resulting in what was called an osteomyelitis after extraction of the tooth. This persisted for two years before it finally healed, after a radical operation. Most of the teeth were later extracted and the remainder were carious. For several years prior to operation, the patient ran the usual course of hyperparathyroidism and roentgenograms revealed cysts in the mandible. A parathyroid tumor was removed.

Hunter[9] quotes the case of Duken in which a tumor of the maxilla which was removed surgically, was an early sign. He also describes three cases pertinent to the subject at hand. A woman, aged 37, complained of pain in the legs, weakness and swelling of the jaw. A biopsy of the jaw tumor led to a diagnosis of giant-cell epulis. After five years, hyperparathyroidism was diagnosed and relieved by operation. In the second case, a woman, aged 49, had complained of frequent urination and renal colic for eleven years. Early in the disease, ex-

3. Wilder, R. M.: Endocrinology, 13:231 (May-June) 1929.

4. Cohen, H., and Kelly, R. E.: Brit. J. Surg., 20:472 (Jan.) 1933.

5. Keynes, G., and Taylor, H.: Brit. J. Surg., 21:20 (July) 1933.

6. Mimpriss, T. W., and Butler, R. W.: Brit. J. Surg., 21:500 (Jan.) 1934.

7. Compere, E. L.: Surg., Gynec. & Obst., 50:785 (May) 1930.

8. Rosedale, R. B.: Am. J. Path., 8:745, 1932.

9. Hunter, D., and Turnbull, H. M.: Brit. J. Surg., 19:203 (Oct.) 1931.

tremity and joint pains appeared, for the relief of which all of the teeth were extracted. After removal of a parathyroid tumor, recovery took place. In the third case, a woman, aged 51, showed among the earliest symptoms multiple abscesses of the teeth and a lump in the lower jaw which was thought to be a dental cyst. This was removed and was diagnosed histologically as a myeloid sarcoma. The diagnosis of hyperparathyroidism was established on the removal of a parathyroid tumor.

Quick and Hunsberger[10] report the case of a man, aged 25, who first noted a swelling of the right maxilla following a blow sustained while boxing. He later developed other bone deformities. He presented a typical course of progressive hyperparathyroidism and was seriously disabled for seven years, during which time he developed a marked pyorrhea and loosening of the teeth. A tumor the size of an olive attached to the right maxilla one half inch anterior to the angle of the jaw was found. Marked improvement followed the removal of a parathyroid tumor.

Elmslie[11] reports the case of a woman, aged 26, who developed an aching of the bones. Six months later, a fibrous epulis was removed from the jaw, and, one year later, a parathyroid tumor was removed, with a successful outcome. The epulis was here a manifestation of the general bone disease.

McMahon[12] describes a patient who two years after suffering marked joint pains and digestive disturbances underwent a dental examination because of gingival soreness and occasional bleeding. A diagnosis of pyorrhea was made and complete removal of the teeth recommended. A roentgenogram taken at this time showed marked alveolar bony absorption. Five months later, after an increasing invalidism, a diagnosis of hyperparathyroidism was made, being verified when a tumor was found at operation.

These are not all the reported cases of hyperparathyroidism early symptoms or signs of which should have or did lead the patients to seek dental advice. Without doubt, many cases in which no mention was made of such complaint were reported incompletely in this respect, the physician's attention being more directed to evidences of disease in other parts of the body. It is only to be expected that, with the decalcification of the jaws as a prominent feature of the general bone resorption of this disease, there will early be symptoms referable to this region. The bony resorption about the roots of the teeth should be expected to cause loosening and favor the development of pyorrhea.

Under these circumstances, it is seen that we are here dealing with a disease an intelligent knowledge of which will be a valuable addition to the armamentarium of the oral surgeon. Not only can the patient with hyperparathyroidism be spared needless surgical interference in a jaw tumor of undetermined origin, or the loss of a large number of teeth unnecessarily where the underlying disease is not discovered, but, what is more valuable, he also can be assured a marked shortening of the period of disability and be relieved of much potential suffering when further study in accord with the dentist's advice leads to the proper diagnosis.

Hyperparathyroidism, therefore, presents a striking example of a situation wherein the collaboration of the dentist

10. Quick, A. J., and Hunsberger, A.: J.A.M.A., 96:745 (March 7) 1931.

11. Elmslie, R. C., et al.: Brit. J. Surg., 20:479 (Jan.) 1933.

12. McMahon, Alphonse: Personal communication to the author, 1934.

and physician can be of much value to the patient. With a realization of the possibilities involved, a consideration of this disease is indicated when swellings, tumors or deformities of the jaw, loosening of the teeth, pyorrhea or unexplained changes in the bony structure of the jaw as seen by roentgenograms are found. Such consideration is not merely an opportunity for the dentist, but also a responsibility. The recognition of it as such, and the wider dissemination of knowledge of this condition among the dentists, will mark a real advance and improvement in the service which this profession is able to offer.

DISCUSSION

Boyd S. Gardner, Rochester, Minn.: Dr. Borg showed us the mandible rather than the maxilla because the mandible makes a much better study than the maxilla, as the mandible can be detached from the skull. It has more or less of a true periosteum and we get more accurate roentgen-ray data than from the maxilla. Dr. Borg, I would like to ask this question: Assuming that all teeth are present, with no loosening of teeth, can we see early manifestations in the mandible from the roentgen-ray standpoint?

Dr. Borg: This question depends for its answer on a knowledge of the normal roentgenogram of the bones. The earliest finding in the abnormal picture is a generalized decalcification indistinguishable from osteomalacia. This condition was seen in the roentgenograms of the teeth of the patient reported by Dr. McMahon, of St. Louis. I showed them to several members of the dental profession in St. Paul, none of whom would care to make a diagnosis, but all of whom recognized the bone as being abnormal. In regard to the early detection of bone changes, I feel that such early decalcification is indication for a study which will consider the possibility of hyperparathyroidism. Where jaw tumors and cystic areas in the bones are seen, we are more apt to be led in the right direction in our studies, and will not overlook the possibility of hyperparathyroidism.

Dr. Gardner: Dr. Borg's paper furnishes information that will tend to create more interest in the osseous changes that take place in the mandible and maxilla, especially when it is found necessary to restore lost teeth. The patients that we have seen in our clinic with this disease have already lost their teeth, in that they have become loosened and their dentists have seen fit to extract. With such bone for a foundation, dentures are not satisfactory, as the patients cannot masticate properly. They complain that they do not appear to have the strength necessary to masticate even the softest foods. I am sure it is very gratifying to dentists to know that this disease can be managed from a medical standpoint and that changes can be brought about so that artificial work will be more satisfactory. Such papers as we have just heard accentuate the necessity of more medical cooperation and more careful study of the changes that take place in the dental field.

Earle H. Thomas, Chicago, Ill.: Members of our society should be on their toes all of the time to diagnose these various conditions that do not arise from a local cause in the mouth but come from general conditions. It is a sad mistake for an oral surgeon to perform operations in the mouth in diseases that are entirely due to some general condition. That includes a great many other disease conditions besides the one that we are discussing this morning, not only of bone, but of the soft tissues as well. As far as the penetrometer is concerned, I do not think that we need to pay so much attention to the amount of calcification in the mandible as we do to the structural changes in the bone canaliculi. It is here that we are going to discover the changes which are salient from a diagnostic standpoint. All men who are examining roentgenograms of the mandible by the hundreds know that the canaliculi can be divided into several different main classes and that each main class can have

several subdivisions. What does all of this mean from a diagnostic standpoint? If one desires to do research work, here is a fertile field. Some day, we are going to be able to diagnose roughly a large number of general conditions by correctly interpreting canaliculi classifications and changes in the mandible. I would like to have Dr. Borg explain how one is to tell whether an increase in blood calcium is due to absorption from bones or to absorption from the diet without the bones accepting it from the blood. Also, when we speak of cysts forming in the bones because of hyperparathyroidism, do we refer just to the general roentgenographic appearance or is there an actual cystic membrane formed? If these so-called cysts disappear after proper treatment, I presume that the term "cyst" is a misnomer.

Dr. Borg: With regard to the significance of the blood calcium in this condition, it must be remembered that it is very difficult to produce a hypercalcemia by anything except very radical means, such as a marked excess of calcium intake, the use of large amounts of viosterol or the administration of parathormone, which draws calcium from the bones. These sources of error can easily be ruled out through a careful history. Probably more important than the determination of blood calcium is the knowledge of the amount of calcium excreted in the urine. This is not significantly increased as far as we know in conditions other than hyperparathyroidism. In other conditions associated with excess calcium loss, such as hyperthyroidism, the stools carry away the excess. With regard to the cysts, they are probably better called apparent, because they are due to the lysis of hemorrhages which occur within the bones. They are difficult to distinguish from the osteoblastoma, into which such hemorrhage may occur. I know of no tissue study which has been made in cured cases, but the serial roentgenograms of reported improved cases suggest that we are not seeing a normal restoration of bone structure. Rather do they indicate the recalcification of affected areas as a part of bone scar formation.

Daniel F. Lynch, Washington, D. C.: I would like to ask Dr. Borg to go into the differential diagnosis between this disease and Paget's disease a little more thoroughly, especially as relates to the mouth.

Dr. Borg: Paget's disease has been considered by some individuals as being associated with hyperparathyroidism. But real studies have served to eliminate it. I think that the crux of the situation is the study of the calcium metabolism. In Paget's disease, we do not find an increased amount of calcium in the blood stream and we do not find an increased amount excreted; so that the calcium metabolic studies are in themselves exclusive or do exclude Paget's disease. Furthermore, the roentgen-ray studies usually are quite characteristic in that there is a marked thickening of the cortex of the bone, and in contradistinction to hyperparathyroidism, in which there is a definite thinning of the bone, Paget's disease produces an overgrowth of bone, i.e., a very thick skull, and the characteristic pathologic picture of Paget's is just the opposite of hyperparathyroidism, in that in Paget's there is a predominant note pathologically of deposition of calcium in increased thickening of the bone; whereas, in hyperparathyroidism, it is a thinning of the bone, an increased resorption or decalcification at the expense of any possible deposition of calcium.

Dr. Lynch: In Paget's disease, there is an increase in the size of the bone. Is there the same thing in hyperparathyroidism?

Dr. Borg: There is an increase from appearances, but it is due to the pushing out of the bone by these hemorrhagic and cystic areas, not by any thickening of the bone itself.

DIFFERENTIAL DIAGNOSIS OF INFLAMMATIONS CONFRONTING THE DENTIST*

By MATHEW PODOLIN, D.D.S., M.S.D., Buffalo, N. Y.

MANY inflammations of the head and neck have similar manifestations and are similar in appearance, but there is some particular symptom of every disease that differentiates it from all the others. We must, therefore, learn to recognize all of the symptoms and by comparison make a diagnosis.

We shall consider these conditions under septic and nonseptic inflammations.

SEPTIC INFLAMMATIONS

A periapical abscess is a circumscribed collection of pus about the root of a tooth; while a bone abscess is a deep and circumscribed collection of pus within the bone; apparently, two distinct diseases, yet, to my knowledge, the dental pathologists and the profession at large usually refer to this condition as a periapical or tooth abscess.

The formation of a pus-filled cavity in the bone should remove such suppuration from the category of periapical abscesses and should lead to its classification as a bone abscess. Along with the difference in the pathologic picture and the anatomic involvement, there are distinctive clinical symptoms associated with these infections.

In the incipient periapical abscess where pus is just beginning to form, the apex is probably eroded, but with no bone destruction apparent. The symptoms may be so mild that it is at times difficult to make a diagnosis. As the abscess begins to destroy bone, the symptoms often become quite severe, being manifested by acute pain and local and general disturbances. This may continue until the tooth is extracted or until the pus bores through the bony plate and escapes into the soft tissues; at which time, the pain is somewhat abated, but the soft tissues begin to swell and possible complicaitons may end fatally.

The alveolar abscess differs from phlegmons commonly known as cellulitis, in which the purulent infiltration is exceedingly diffused, permeating the cellular tissues in various directions. Phlegmon or cellulitis is commonly regarded as much more dangerous than alveolar abscess, since it is much more difficult to treat and the prognosis is always doubtful.

Clinically, the local reaction to an alveolar abscess is characterized by toothache, swelling and redness due to dilatation of the arterioles, capillaries which are overfilled with blood, causing a hyperemia. Because of the increased flow of blood, the area feels hot. After dilatation of the vessels, cells and fluids pass out into the extravascular tissues about the accumulating bacteria, increasing the swelling. The tissues then become tense and overfilled, irritation of the sensory nerve endings causing pain, which is accompanied by soreness and tenderness. About this time, the pus will break through the outer alveolar plate and produce the typical subperiosteal alveolar abscess; which, to the palpating fingers, gives the characteristic sensation known

*Read before the Buffalo Dental Society, Nov. 13, 1934.

as fluctuation. Along with the throbbing pain, the patient may suffer from some degree of septic intoxication, fever and a corresponding increase in pulse rate. So much for the alveolar abscess.

In the case of cellulitis, the picture of a local reaction is somewhat different. The involved tissues become so packed with cells and exudate that they are hard and indurated. An area of intense tenderness and a point of fluctuation may not be palpated, especially before localization takes place. On the basis of the duration and extent of the phlegmon, the patient begins to show real signs of toxic absorption. The fever is correspondingly increased, being associated with chills, sweats and general malaise. The intensity of the symptoms is indicative of the severity of the infection. The temperature may vary from just a little above normal to as high as 105 F., and even higher. The pulse may be correspondingly high or low. It is this variation in the relation of pulse to temperature that determines the severity of the infection and the possible prognosis of the disease, and not the temperature alone.

Usually, with the elevation of body temperature, there is present an increase in the pulse rate. A high temperature means good resistance, a low temperature may mean low resistance and, therefore, an inability to battle with the infective organism. The bacteria, having overcome the natural resistance, liberate toxins into the blood stream, the resulting toxemia causing increase in the pulse rate. With few exceptions, the temperature elevation is proportional to the resistance of the body.

The clinical symptoms of Ludwig's angina are characteristic of the disease. The extension into the soft tissues of the floor of the mouth and the rapid invasion of the cellular planes bind all the structures into a hard boardlike mass.

Although regarded by some as a defi-

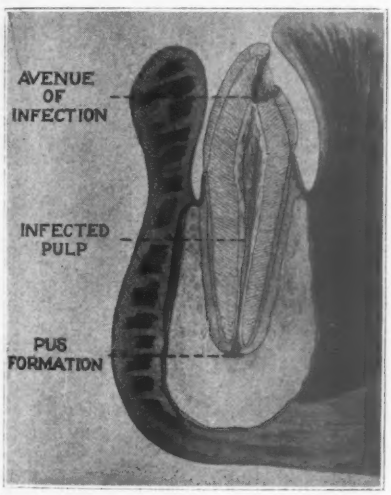


Fig. 1.—Tooth abscess in incipient stage.

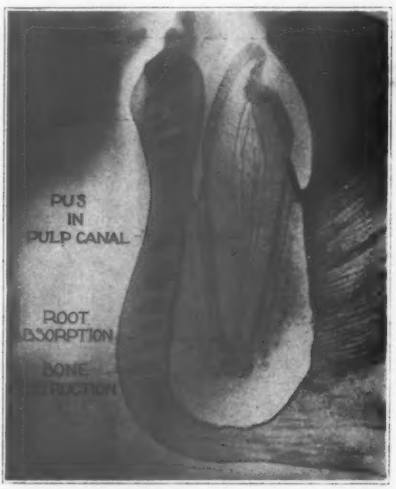


Fig. 2.—Tooth abscess in advanced stage. The two distinct pathologic pictures presented in Figures 1 and 2 are commonly referred to as periapical abscess.

nite clinical entity, Ludwig's angina is, I am inclined to think, a fulminating phlegmon invading the floor of the mouth and its adjacent structures and due to the presence of a high virulent organism, a hypersensitivity or a break in the balance of resistance, any one or two or all three conditions combined.

Empyema of the maxillary sinus produces pain, tenderness and a sense of fullness over the affected area, frequently associated with swelling of the face and all other symptoms attributed to an abscess. The pain may be local or in the form of a headache, differing from the head pain that is caused by eye strain in that it is not relieved by resting the eyes. The pain may be intensified by stooping over. A possible discharge of purulent matter from the nostril on the affected side is evidence of a suppurating sinus, but since the frontal, ethmoidal and maxillary sinuses discharge pus in the same area, it is imperative to establish the source of infection.

Roentgen-ray examination and transillumination are frequently resorted to as an aid to diagnosis, although sometimes they are misleading. Variations in the thickness of the antral wall, the fluid or the growth may cause a shadow or blurred outline, resulting in confusion; but by puncturing or aspirating the antrum, a diagnosis can be clinched.

Frontal sinus infection is characterized by headache above the eyes, usually on either side of the midline and associated with local tenderness to deep pressure and dullness on percussion. The pain may be worse in the morning, subsiding later in the day. Roentgen-ray interpretation may help, although frequently confusing. A positive diagnosis can best be made by puncturing the air cells.

The dentist may recognize a mild form of orbital cellulitis, but becomes confused

Fig. 3.—Appearance of patient with acute alveolar abscess.

Fig. 4.—Appearance of patient with acute cellulitis.

when the patient develops an acute orbital cellulitis as a result of a dental infection. The symptoms in the mild case are moderate swelling of the lids, some exophthalmus, defective vision, where one object appears as two, and dull pain, with little or no constitutional disturbances. In the case of an acute orbital cellulitis, the modified symptoms are chills, fever, deep-seated pain intensified by movements of the eyes, severe headache and partial or complete loss of mobility of the eye ball.

Fig. 5.—Appearance of patient with acute diffused cellulitis.

The lids are greatly swollen and edematous, the conjunctiva is ecchymosed and hyperemic and the entire area around the involved orbit, and sometimes the entire face, is markedly swollen.

Cavernous sinus thrombosis, which is sometimes very hard to differentiate from the acute orbital cellulitis, can result from a dental infection, although commonly it is caused by squeezing a pimple on the upper lip. The appearance of the patient is so striking that when the condition is seen once or twice, it can never be mistaken for any other. In a differential diagnosis, the orbital cellulitis is indicated by: 1. Marked edema of the lids and conjunctiva of the involved eye. 2. Protrusion of the eyeball, with impairment of its mobility, even to actual paralysis. 3. Reduction in vision, due to optic nerve involvement. 4. Swelling of the gland behind the ear. 5. Violent pain and fever. 6. Marked induration of the maxillary fascial area, with some regional adenopathy in the submaxillary and post-cervical regions. 7. With the advent of the cerebral symptoms, the beginning of the cavernous sinus thrombosis, indicated by severe headaches, vomiting, stupor and pulse retardation. 8. Engorgement of the retinal veins. 9. Edema of the mastoid area (doughy feel). 10. Possible involvement of the other mastoid area and the other eye, the transverse sinus carrying the infection. 11. Severe cerebral reactions with septic fever and chills, late symptoms, which are usually followed by death.

Infective parotitis is characterized by a swelling in one or both parotid glands, although generally it is unilateral. The enlargement usually appears first in front of the lobe of the ear, but later spreads to the whole gland. The onset is sudden and is accompanied by pain and tenderness over the gland, the pain being aggravated by the movements of the lower jaw. Epidemic parotitis, commonly known as mumps, is an acute contagious nonsuppurating infection of the glands marked by an extensive edematous swelling on one side, the other side being affected later. The mumps begins to subside about a week after its onset. An infective parotitis has to be treated as any other suppurative disease.

Suppurative bilateral parotitis of metastatic origin is usually secondary to some systemic disturbance. The swelling may

assume the proportions of a diffused cellulitis, accompanied by fever and the usual symptoms of septic infection. By slight manipulation, pus may be discharged from the swollen papillae opposite the upper second molar. Undue pressure is not to be applied in any of the septic inflammations.

Osteomyelitis of the jaw, often preceded by an acute periosteal abscess, may follow injury, alveolar abscess, syphilis or mercurial, phosphorous or arsenic poisoning, and, in some rare cases, as a result of typhoid fever. An early diagnosis is very difficult. Its presence may be inferred by the long continuance and profuseness of the discharge. At the onset, there is marked swelling involving the face and neck on the side of the infection. A few days later, this is followed by loosening of the teeth. Pain becomes throbbing and is accompanied by a rise in temperature. The roentgen rays are of no value in the early periods of osteomyelitis, but, after a week or ten days, they become very important in watching the progress of the disease.

Suppuration of the lymphatic glands should be diagnosed from the tenderness and redness of the area involved. Look for the focus of infection and the diagnosis will be established.

A tonsillar abscess may start very much like a dental abscess. As a matter of fact, it may originate from a posterior alveolar infection. The symptoms are very similar, but the swelling and tenderness are usually below and behind the angle of the jaw. A peritonsillar abscess, like an alveolar abscess, is frequently associated with trismus; which makes it quite difficult to examine the interior of the oral cavity. With slight treatment, the trismus can be relieved and so intra-oral examination be permitted, and careful inspection of the tonsils will establish the diagnosis.

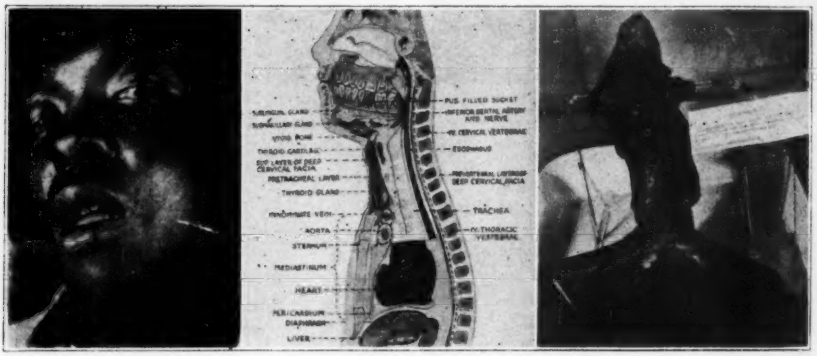


Fig. 6.—Ludwig's angina.

Otitis media and mastoid abscess are frequently seen in the dental office, but the dentist need have no difficulty in recognizing the symptoms, which are characterized by an acute pain in the ear, reddening and swelling behind the ear and considerable toxemia, fever and all other symptoms associated with a highly septic infection. The dentist should make a thorough inspection of the oral cavity for possible dental infection, referring the patient to an ear specialist with a note indicating his findings.

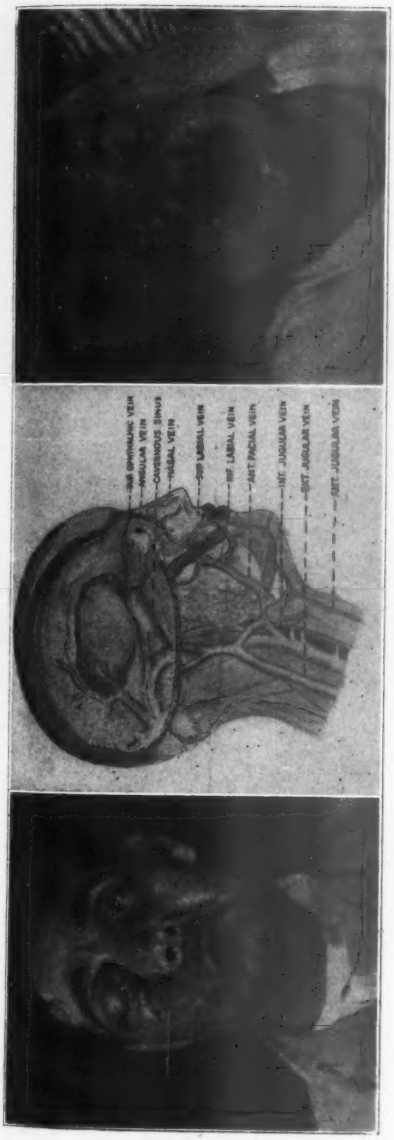


Fig. 7.—Left, orbital cellulitis. Right, cavernous sinus thrombosis.

Sometimes, the dentist may be called on to determine the cause of a swelling, pain and stiffness of the neck, the patient perhaps suffering from a toothache at the same time. A retropharyngeal abscess may be the cause. In adults, it is usually of a tuberculous nature. The diagnosis may be established by taking a lateral roentgenogram, which reveals cervical caries.

Carbuncles are quite obvious by the time they mature, being characterized by an elevated, very painful hard lesion, sometimes having more than one opening discharging pus. A carbuncle on the upper lip should be regarded very seriously. It is best to defer any dental work until the carbuncle disappears.

Herpes about the face, especially about the lips, sometimes assumes unusual proportions and may cause considerable confusion. The characteristic lesion of herpes is a cluster of transparent vesicles varying in number and seated on an erythematous patch, surrounded by a narrow red zone and sometimes causing extensive swelling of the lip or the region where it is located.

Anthrax affects people working with wool and horsehair in factories. The disease is frequently seen about the head and neck, and is characterized by the formation of vesicles which burst, form a scab and are then surrounded by a ring of vesicles and an area of edema. The lymph glands are enlarged, and there are marked constitutional symptoms, fever, chills, sweats and delirium. The diagnosis is substantiated by the microscopic finding of the square-ended gram-staining bacilli of anthrax.

Occasionally, a patient may appear in the dental office with an erythema about the face which may thoughtlessly be attributed to ultraviolet-ray treatment or perhaps the use of hot poultices. The alert dentist should make sure that he is

not dealing with a case of erysipelas. The most characteristic symptom of this disease is the inflammation of the skin. It is a vivid red edematous swelling having the tendency to spread in various directions, although the outline continues to be well marked, the edges being raised and well defined from the healthy skin. The skin is hot and there is a burning or an itching sensation. There is no perceptible pitting on pressure; which differentiates it from the erythema caused by heat.

Fig. 8.—Chronic osteomyelitis.

NONSEPTIC INFLAMMATIONS

Contusions and injuries are so obvious that they need no specific mention.

If the whole face is puffy and the eyelids are edematous, the urinary and cardiac systems are to be examined for disease.

Angioneurotic edema, which can be recognized by the occurrence of local edematous swelling, limited and transient, may appear anywhere on the face, although a more common site is the upper lip. This condition, which is associated with urticaria, may be produced by foods or drugs, notably acetylsalicylic acid.

Actinomycosis, in the early stages, gives rise to inflammatory changes which simulate an alveolar abscess. The similarity is further increased by the presence of carious teeth through which the fungus gains access to the jaw. It is characterized by a large hard indurated swelling having multiple lesions discharging a thick exudate in which the sulphur granules are found. The finding of this gram-staining mycelium establishes the diagnosis.

Fig. 9.—Septic parotitis. Figures 8 and 9 show very similar swellings, though of two distinct diseases.

It should not be difficult to decide whether a swelling is inflammatory or a new growth. Tumors common to the parotid gland are fibromyxoma, which is of slow growth and encapsulated, and not very hard to distinguish. The malignant tumors of the parotid region grow rapidly, soon involving the whole gland,

affecting all the structures behind the ramus of the mandible and the facial nerve and causing Bell's palsy.

A calculus may be found in Stenson's duct, but is more commonly found in the duct of the submaxillary gland. In the early stages, it gives rise to sudden intermittent swelling of the affected gland, when the stimulus of food gives rise to salivary secretion. In chronic inflammation, the swelling may become permanent, owing to the long standing distension. The diagnosis may be made by feeling with the fingers over the duct, by pricking the calculus with a needle, by pressing a fine probe through the duct, causing grating on the stone, and by the use of the roentgen rays.

Fig. 10.—Maxillary sinus infection.

Osteoma is a rare slow-growing, well-defined hard, bony and usually not very large mass. Although it may appear anywhere on the jaws, a not uncommon location is the angle of the jaw, in the lower bicuspid region, projecting lingually. When appearing in this region, it is usually bilateral.

Odontomas may originate from any dental tissue, either the tooth germ or the fully formed tooth. The roentgen rays and a careful check-up on the teeth, to determine whether any are missing, aid in diagnosis.

When there is hypertrophy of the whole bone rather than a local swelling, we are probably dealing with a case of acromegaly. The rest of the bones, especially of the hands and feet, become enlarged. This disease is to be differentiated from leontiasis ossea, a rare disease characterized by a hyperostosis of the facial and cranial bones, but lacking the changes in the hands and feet.

Fig. 11.—Peritonsillar abscess. The appearance of the patients in Figures 10 and 11 is quite similar, yet the clinical symptoms and the pathologic pictures are entirely different.

The epulis is common, and the average dentist excises this apparently innocent tumor, not realizing that this may be the beginning of the end. Epulis may develop into sarcoma. Many authors assert that the fibrous epulis has its origin

in bone. I am inclined to believe that it arises from the peridental membrane and may later infiltrate the bone. In any event, the teeth adjacent to the tumor should be extracted and a generous amount of bone should be removed to avoid a sarcomatous development.

We cannot overemphasize the importance of early diagnosis in cases of malignancy. When there is doubt, a possibility of inflammatory involvement should be eliminated by a careful oral examination for any source of infection. No one is better equipped to make this than the dentist. The responsibility, therefore, rests on his shoulders. He must familiarize himself with oral pathology to the extent that he be able to make a complete mouth survey for any possible disease and not just examine the teeth for cavities.

Sarcoma and epithelioma are the malignant lesions invading the dental field. Sarcoma may be associated with constitutional changes simulating inflammatory conditions when of rapid development, but, when of slow growth, it may be confused with the benign tumors. An examination should determine whether the usual signs of inflammation are present and whether there is any possible source of infection. The history and duration of the swelling are to be considered. Age is to be disregarded since sarcoma may occur at any age. The nature of the swelling must be determined, as to whether it is hard or soft, the bone is expanded, the tissues around the bone are infiltrated or the glands are enlarged. This disease is usually circumscribed at first and the swelling is more or less rounded and painless, unless there is pain from pressure on the nerve trunk. Infiltration into the adjacent tissues makes them appear fixed. In the early stages, the overlying skin appears normal, but it becomes ulcerated at a later stage. A roentgenogram should be made, and, if everything else fails, a piece of bone should be chiseled off and examined microscopically.

Epithelioma is a very insidious and destructive disease. By some curious and unfortunate coincidence, it is curable only in the stage in which it is very liable to be overlooked. When every dentist and every physician learns to recoginze cancer in its incipiency, it will soon become a disease of the past, at least as far as the head and neck are concerned. Until then, permit me to offer this dictum, which I believe should be heeded by every practitioner endowed with the right to treat human ailments: Regard every suspicious lesion guilty until proved innocent.

Cancer should be distinguished from syphilis in both the primary and the tertiary stage. In the primary stage, chancre of the lip is not difficult to differentiate from carcinoma. A history of the case, duration of the lesion and early involvement of the lymph nodes should be considered. Epithelioma rarely appears on the upper lip, while chancres, though having a preference for the lower lip, frequently appear on the upper lip. The character of the lesion itself is of great diagnostic value.

The chancre begins as a small papule between two and six weeks after infection and gradually enlarges, having a hard indurated border around it. As it matures, it usually ulcerates in the center and discharges a clear serum. It is definitely circumscribed and does not infiltrate the surrounding tissues, does not bleed unless traumatized and is seldom painful. A dark-field examination and a Wassermann test confirm the diagnosis.

In contrast to the rapid growth of the chancre, that of the carcinoma is slow and usually painful, and there is a tend-

ency to bleed freely. Its extension and infiltration into the surrounding tissues are relative to the duration of the lesion. A biopsy will confirm the diagnosis.

Remarks made about the lip apply equally to ulcers elsewhere about the mouth. Tumors of the antrum merit special attention, for they may cause no real pain or swelling until later stages. Fortunately, the possibility for a recurrence after eradication is less than in cancer elsewhere in the human body. The commonest tumors of the antrum are the sarcoma and endothelioma. They are characterized by rapid growth, bulging into and invasion of the surrounding fossae, pain, discharge of pus from the nostril on the affected side and infiltration of the overlying skin, which are all symptoms of an inflammation. Roentgen-ray examination and transillumination help to confirm the diagnosis, but an exploratory or a histologic examination is frequently necessary to establish the diagnosis.

Time and space do not permit a discussion of the inflammatory infections of the tongue, floor of the mouth and other regions that rightfully belong under the heading of this paper. Most of the diagnostic symptoms mentioned can, with some modification, be applied to other involvements about the head and neck.

560 Delaware Avenue.

COMPARATIVE VALUES OF MODERN DENTURE MATERIALS*

By J. B. HATHORN, D.D.S., Wichita Falls, Texas

THE dental profession now appears to be definitely committed to the use of natural appearing denture base materials. We have been toying with the idea for a long time, trying one substitute for rubber after another, always with the fear that it would prove unworthy and we would have to return to vulcanite as the material of choice. Now a number of conditions are tending to prevent a return to vulcanite. We have exhibited these beautiful, lifelike dentures for a number of years, the public has become interested and denture patients are now demanding them. The manufacturers have gradually been improving the new materials and coming closer and closer to the ideal demanded by the profession, thus breaking down the sales resistance of the dentists themselves; and finally we are all loath to return to rubber after tasting the satisfaction of producing really esthetic dentures.

Vulcanite is a dependable material, on which our profession has relied for a great many years. It has always been unsatisfactory as regards appearance and cleanliness. The factor of appearance alone is, in many cases, sufficient to contraindicate its use.

Coincidently with the introduction of bakelite and pyroxylin in the commercial fields, the manufacturers began to experiment with these materials as bases for dentures. In the dental field, they met conditions which are less ideal. The bases must be molded in plaster or artificial stone instead of in steel, with a con-

*Read before the Section on Full Denture Prosthesis at the Seventy-Sixth Annual Session of the American Dental Association, St. Paul, Minn., Aug. 9, 1934.

sequent great reduction in the pressure possible and, after being formed, they must withstand conditions in the mouth which may be detrimental to their success.

We are all familiar with the history of a succession of such experiments during the last ten years: first, the condensites, which proved too friable, then the celluloids, which failed from warpage, and later the thermoplastic resins, which are failing from breakage in the mouth.

A certain amount of failure and disappointment should perhaps be expected with the introduction of new materials and new methods. The sad and unfair part of this experience is the fact that we, the dental profession, have had to do all the experimenting, while the manufacturers reaped the profits. It seems that any manufacturer can introduce some new material or even an old material with a new name and in a new box and, with the proper advertising, convince the trusting dentist that here at last is the perfect denture base. Then because failures with these materials are not immediate, the profession invests a good deal of time and considerable of the public's money in a base material which may later be discarded as worthless. Such a situation should not be allowed to exist. Hundreds of thousands of dollars could have been saved the profession and more can still be saved if some agency will make physical tests of these materials and set up standards for them, as has already been done for amalgam and casting golds.

To be successful, a denture base material must have certain minimum qualifications. It must have a certain amount of strength and of elasticity, a certain resistance to change of form and to disintegration in the mouth; etc. I can see no reason that these qualifications cannot be reduced to accurate figures by physical laboratory tests, and standards for the different qualities be adopted which must be met by the manufacturers in order for their products to be accepted.

It has been argued that laboratory tests are not practical. It may be that they are not infallible, but I have no doubt of their practicability. The truth is that, with one or two exceptions, none of the manufacturers have ever made tests of these materials. They have put them on the market, claiming everything up to and including perfection, and then let the dental profession find their defects; which we very generously have done.

Of course, laboratory tests must be made in a practical way and interpreted strictly in the light of clinical experience. Experience will teach us, in fact it has taught us, the minimum standards that we require. For strength, we should

AVERAGES

Material	Elasticity		Strength		Warping Degrees	Absorption Per Cent
	Bending Degrees	Torsion Degrees	Breaking Pounds	Dropping Inches		
Base rubbers	16	16	36	13	$\frac{1}{8}$	0.06
Cellulose bases	19	17	18	25	11	0.90
Condensites	7	9	27	4	2	0.20
Resin bases	19	16	33	27	$1\frac{3}{4}$	0.15

demand that of the best vulcanite. In this regard, the condensites have failed us. For permanency of form, we should have a material showing a minimum of distortion at from 130 to 140 F. Such distortion is the most frequent cause of failure of the pyroxylins. For resistance to fatiguing strains, the equal of good vulcanite would be satisfactory. This is where the resins have failed.

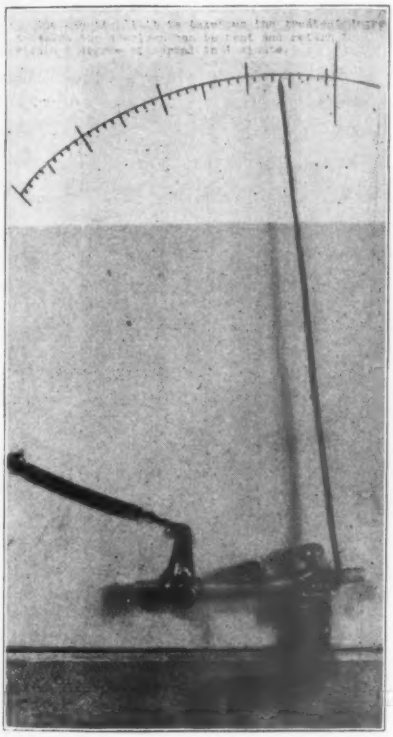


Fig. 1.—Flexion machine.

Fig. 2.—Torsion machine.

These properties and the others that are important can and must be reduced to figures by laboratory methods, and standards adopted. Then, if a dentist or laboratory wants to use a material which is substandard in regard to any property, he may at least know what chances he is taking.

Because of the unavailability of such laboratory experiments and to satisfy my own curiosity about the subject, I have contrived some instruments of my own and, during a period of about three years, have tested all of the denture materials which I have been able to obtain. As a basis for comparison, I tested eighteen different kinds of vulcanite rubber. Since we know pretty well what to expect of a vulcanite denture, we can, by comparing our tests, build up certain expectations for the newer base materials.

Since my time is limited, I shall not go into the results of testing individual materials, but will sum up the conclusions reached for the various types of bases. The newer materials may be divided into three classes: the pyroxylins, the thermoset resins and the thermoplastic resins. For convenience, let us call them celluloids, condensites and resins. The celluloids are cellulose nitrate or cellulose acetate; the condensites are phenol-formaldehyde; the resins are of the vinyl, styrol or glycerol types and there are combinations of these, such as vinyl resin with cellulose acetate.

Fig. 3.—Transverse strength machine.

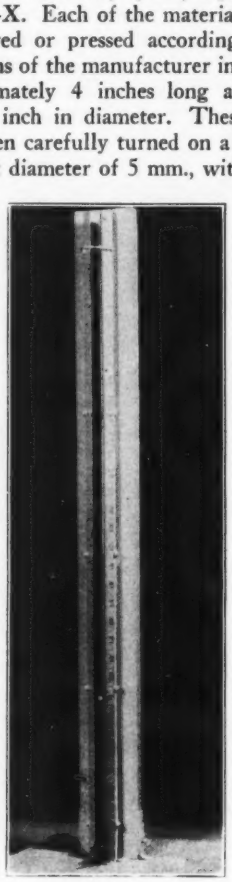


Fig. 4.—Impact machine.

I have tested six celluloids: parfait, ora-tint, hecolite, alcolite, natura and everlite; five condensites: iteco, coedal, co-oral-ite, C E 950 and luxene, and four resin bases: resovin, vydon, superez and denture-X. Each of the materials tested was cured or pressed according to the directions of the manufacturer into sticks approximately 4 inches long and one-quarter inch in diameter. These pieces were then carefully turned on a lathe to an exact diameter of 5 mm., with an accuracy of at least 0.1 mm. I then tested these specimens to determine their relative merits as to elasticity, strength, warpage, fatigue and porosity.

The factor of elasticity is important in a denture-base material because it determines to what extent the material can

compensate for strains in and out of the mouth. I find that none of our base materials are perfectly elastic in the sense that many metals are. In other words, none of them after being bent will return to the exact form which they had originally.

In order to determine elasticity, I made two machines. The first is made to bend the test piece longitudinally. (Fig. 1.) The specimen is clamped in position in the machine, and pressure from a screw bends it to the degree read on a scale. I have arbitrarily decided to take the elastic limit of the material as the greatest

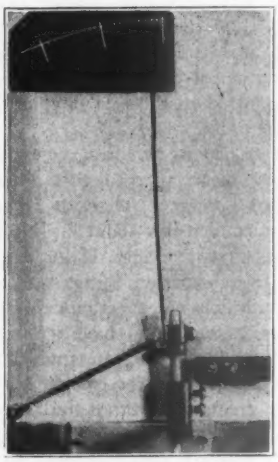


Fig. 5.—Warpage Machine.

degree to which the specimen can be bent and return to within 1 degree of normal in one minute.

The result of this test is an indication of the ability of the material to compensate for stress. Base rubbers show an elastic limit of about 16 degrees, condensites only 7 (at which point they usually break), celluloid bases 17 and resin bases 19. The celluloids and resins are more elastic than rubber, while the condensites are much less elastic.

Another machine is capable of twisting the test piece. (Fig. 2.) The amount is read on a scale and the results of elasticity on this machine compare almost exactly with those of the bending machine.

These tests for elasticity show that any of the base materials that we use have an elastic limit which should exceed any strain to which a denture could be subjected in the mouth. The low limits for the condensites (about half of that for any of the other materials) undoubtedly accounts for a great deal of accidental breakage out of the mouth.

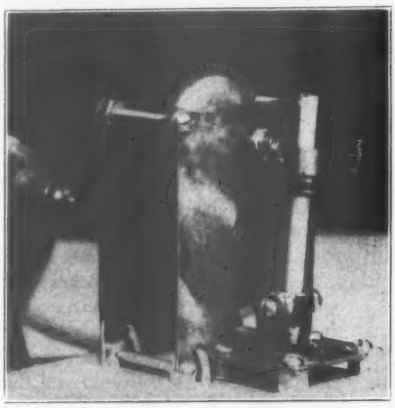


Fig. 6.—Fatigue machine.

The characteristic of strength depends on a number of different factors: hardness, toughness, stiffness and resistance to fatigue. For our purpose, hardness and stiffness are relatively unimportant as our dentures are broken usually by a sharp accidental blow outside the mouth or by fatigue of the material within the mouth. As certain of the manufacturers base their claims of strength on tests made by applying a steady pressure or weight to the test piece, I have included that test in my

experiments. The characteristic so tested is called transverse strength.

I have a machine which applies a steady, continuously increasing pressure to the test specimen until breakage occurs. (Fig. 3.) As a lever is moved, the pressure is increased and the amount of pressure in pounds can be read directly on a scale. The average base rubber breaks on this machine at 36 pounds. Condensites break at about 27 pounds, the resin materials at 33 pounds. The celluloid specimens will not break at all, but bend double at about 18 pounds. One manufacturer whose product is a condensite claims that it is as strong as good base rubber, and so it is by this test, though it falls far short when tested by a falling blow.

The more important test is for impact strength. This is made on a machine which drops a steel ball vertically on the test piece, which is clamped at the bottom of a trough or track. (Fig. 4.) In this test, the average vulcanite breaks at about 13 inches drop, the condensites at 4 inches, the celluloids at 26 inches and the resins at 27 inches. This test proves that the condensites are only about one third as strong as vulcanite when resisting a sharp blow, while celluloid and the resin base materials are twice as strong as vulcanite.

An interesting comparison can be made between the strength of these materials and that of glass. The transverse strength of glass on my machine was 43 pounds, which is greater than that of any of the base materials that I tested. On the impact test, glass broke at 4 inches, which was exactly the figure for the average condensite and just one third of that for the average vulcanite.

Dentures made of some materials, particularly the celluloids, seem, in many cases, to change shape in the mouth, and this may be due to pressure exerted at the moment when hot food or drink has raised their temperature. In order to test the degree of warpage of the different materials under heat, I made a machine which holds the test specimen and bends it by spring pressure. (Fig. 5.) The piece is clamped to the base, the indicator set at zero and the spring attached. The whole machine is immersed in water at 130 F. for one minute. The spring is released and the case allowed to cool, the resultant warpage being read on a scale. The spring pressure as well as the temperature are arbitrary, of course, but both factors are, I believe, within practical limits. The mouth can easily tolerate liquids at 130 F., and persons wearing dentures can, I believe, take hotter foods and liquids than those of us who do not have the palate covered.

The results of this test show that the vulcanite pieces warped only about one eighth of 1 degree, the resins $1\frac{3}{4}$ degrees and the condensites about 2. The celluloid materials averaged 11 degrees. We know from experience that warpage in the mouth does not affect vulcanite to any practical extent. Nor have we had failures of condensites or resins which might be due to warpage. Some of the celluloids show a great many times the amount of warpage of the other materials, and no doubt a material which shows a warpage of 4 or 5 degrees in this test is entirely unsuited for use as a denture base.

We have often had failures with vulcanite and even with metal bases owing to fatigue of the material. This type of failure is most commonly evidenced by the splitting of upper dentures through the palate area after settling of the denture has allowed a bearing on the hard palate. These failures occur also with the newer materials, but they have been particularly annoying with the thermoplastic resins.

The common fatigue test for metal

wire is made by bending the test piece through a given arc repeatedly until it breaks. I made a machine to test base materials in this manner. (Fig. 6.) The test specimen is fixed by one end to the base and a revolving arm flexes the other end through an arc of approximately 24 degrees, or 12 degrees in each direction. This is, of course, a greater bend than would be possible in a denture in the mouth. The degree of flexion is less than the elastic limit of the materials tested, and, I believe, gives a fair indication of their resistance to fatigue.

One of the interesting results of this test was the determination that some of the natural rubbers are capable of withstanding three or four times as much fatiguing stress as the best of the colored rubbers. Another astonishing discovery was that the resins, which have been considered weak in this characteristic, will withstand more fatigue than the best rubber.

The last test is for porosity. This factor may be important in a denture base material for two different reasons. It is natural to suppose that a more porous material will absorb more of the fluids of the mouth, an unhygienic condition resulting and making the denture difficult to clean. It is also possible that materials which have a high degree of porosity may change shape owing to absorption of moisture in the mouth and the loss of this moisture when the denture is left out of the mouth for any length of time.

In order to determine the relative degree of porosity, I tested specimens for water absorption. The test pieces were weighed in a dry state to an accuracy of 0.001 gm., then immersed in water for six days and weighed again. The amount of gain in weight is computed in percentage of the original weight. Of course, six days is not long enough to determine the maximum water absorption, but it does give an index of the relative porosity of the different materials. I found that some pieces which were weighed again after a month had practically doubled their gain in weight over the six-day period, and this is probably nearly the maximum amount of absorption.

The results of this test were also quite surprising. I have always considered vulcanite a very porous material, but test pieces after six days showed an average of only 0.06 per cent gain in weight, while the resin bases gained 0.15 per cent, condensites 0.20 per cent and the celluloids 0.90 per cent. It will be noted that, in this test, the celluloids again fall down, the figures showing four or five times as much water absorption as any other class of material; which indicates that these materials are much more porous than the others.

As regards the surprising results obtained in determining the density of vulcanite, I believe that my figures are fairly accurate, but that the many vulcanite dentures which are found in such an unhygienic condition have undergone improper vulcanization. Very thick dentures should, of course, be vulcanized at a lower temperature for a longer time, though this procedure does not seem to improve specimens of the size that I have used for my tests. I found that vulcanizing between tin foil does increase the strength, elasticity and density of rubber.

Of course, all the materials in each class do not have exactly the same properties or show the same results, although the averages given are a fair indication. (Fig. 7.) For instance, in considering the condensite materials, we find that they have about one half the elasticity of rubber and almost as much transverse strength, but only about one third the impact strength. The figure for warpage is not excessive and water absorption is low. The one major defect of the con-

densites, low impact strength, has been a great objection to their use, and until their strength can be raised to approximately that of rubber, they cannot expect any greater popularity. Another inherent weakness of the material seems to be due to the fact that it comes to us in a semicured state and that time as well as temperature is a factor in its final cure. This means that we receive our material in different stages of cure, depending on the time it has been kept in stock by the dealer and the temperature at which it has been maintained; and it also means that there is a possibility of the cure continuing in the patient's mouth after we have finished the processing.

The celluloids have more elasticity than rubber and less transverse strength, but twice as much impact strength. The warpage figure is very high and so is the water absorption or porosity. These disagreeable properties are doubtless inherent in the material, and it is doubtful that any great improvement can be made.

The resin bases show practically the same elasticity and transverse strength as rubber and an impact strength greater than celluloid and twice as great as vulcanite does, and a minimum of warpage and of water absorption. As far as these tests go, the resin materials appear to be superior to every other. We know that their color and color life are good and the techic is simpler than for condensite. Results in the mouth have in many cases been disappointing and here is fuel for the contention that laboratory tests are not practical.

In my own practice, having definitely discarded the condensites, the strongest of which I find to have no more impact strength than glass and also the celluloids whose permanence can never be depended on, I am forced to a choice between resin and vulcanite.

Inquiry leads to the discovery that a great difference exists in the experience of various dentists and of various laboratories with these resin bases. Some have had a consistently high percentage of success and some a high percentage of failure. This disparity could be due to either a difference in the material itself or a difference in the technic of manipulation. I convinced myself first by testing a good many different batches that the material was uniform, the conclusion being that the difficulty must lie in some step in the technic.

The manufacturers of the resin materials, particularly the S. S. White Co. and Lee Smith & Son, believe that breakage in the mouth is due to molecular strains in the material. These strains, they say, may be present in the blank or they may be introduced by molding at too low a temperature. They believe that there is a self-annealing temperature (around 275 F. for resovin and vydon) at which these strains are relieved, and that results are better if the material is molded at 275 F. or a higher temperature.

I have never seen a case of warpage in vinyl resin which might be attributed to molecular strain. If there is such a molecular strain present, the fact should be easy to prove. If a straight stick of the material is cut out of a blank or out of a repair stick, heated in boiling water and bent at right angles, certainly molecular strain has been introduced into that stick. If the stick is chilled in this bent condition and then gradually reheated, the molecular strain makes itself evident by causing the stick to straighten out. It begins to unmold at about 110 F. and, by the time the water boils, it will have returned almost to its original form.

To repeat the experiment: The straight stick is bent at right angles and chilled, then put in a flask, in a right-angle mold and pressed. When the

molded right-angle piece is reheated, it shows no tendency at all to unmold, and the temperature at which it was pressed is immaterial. It may have been as low as 212 or as high as 300 F. This phenomenon is beyond my understanding; but it is proof that there can be no molecular strain in any resin denture.

If there is no molecular strain in resin, there is no particular reason for pressing at high temperatures. In fact, my experiments prove that lower temperatures produce stronger dentures, and we know that the color is better. This experiment also proves that the cause of breakage cannot be molecular strain; we must look elsewhere.

Our failures with resin bases have been almost entirely from breakage inside the mouth. This type of breakage can come from only one cause, fatigue. Yet in fatigue tests made in the laboratory, the resin materials show more than twice as much resistance to this kind of strain as does rubber. I discovered what I believe to be the true cause of failure quite by accident: that all these resin materials possess the peculiar property of becoming crystallized owing to fatigue. After a test piece is bent repeatedly for a period only one sixth as long as is required to break it, it loses 85 per cent of its strength in resisting impact. So while the actual fatigue point of resin is high in comparison with that of the other base materials, the crystallizing effect of fatigue on this material causes its failure by lowering its resistance to other stresses. Fatigue does not seem to affect the strength of rubber or of the other base materials in this way.

Now this property of crystallization is a phenomenon of molecular rearrangement, and the same thing occurs in steel. A steel automobile axle becomes crystallized from repeated stresses and finally may be broken by an impact much less than would have been required to break it originally. In order to prevent crystallization, the driving rods and other vulnerable parts of locomotives are removed periodically and annealed.

Such annealing is also effective in resin dentures. If the material is pressed and cooled quickly, as the manufacturers advise, it is tempered and will crystallize quickly. If allowed to cool in the flask very slowly, the material is annealed and shows almost no tendency to crystallization from fatigue. The material seems to act much as steel does in that annealing prevents crystallization. With this major defect removed, we have at our command a very acceptable material for denture bases.

To produce an annealed denture of resin, it is necessary to reduce the molding temperature materially. Everyone who has had practical experience in pressing these materials has learned that time as well as temperature is a factor, especially in its effect on the color. A vydon or resovin case may be pressed quickly at 275 or even up to 300 F. and, if it is cooled quickly, a good color will result. If it is pressed at 275 F. and cooled slowly in the flask, the color will be dark. It has been found that the flowing temperature of vinyl resin is about 250 F. That is the temperature at which two pieces will make a perfect union, and it should be the minimum molding temperature. A case pressed at a temperature range of 250 to 260 F. and air cooled for two hours in the flask will have a good color.

One factor of breakage in our newer base materials is seemingly little understood. All of these materials adapt themselves more closely to the cast than does vulcanite. We have always been used to relieving the area over the hard palate without exactly understanding that a vulcanite denture gives an automatic relief in this area besides that which is provided. This is due to the fact that rubber

contracts from 5 to 6 per cent in vulcanization and toward its center of mass. A few measurements of vulcanite dentures will show that this automatic relief may be as much as 1 mm. in the anterior portion of the palate. Therefore, in order to attain the same relative adaptation with resin, celluloid or condensite that we do with vulcanite, it is necessary to increase the palatal relief about 1 mm., especially in the anterior part. Attention to this one point would probably have prevented a large proportion of our failures with the resin materials.

CONCLUSIONS

1. The method of selecting denture base materials on a basis of trial and error is unfair to the dental profession and to the public.
2. Laboratory methods of testing these materials can be made practical if the results are carefully interpreted in the light of clinical experience.
3. My own experiments in this field indicate the marked superiority of the vinyl resin materials, particularly so when these bases are annealed in the pressing technic.
4. I believe that this study of denture base materials should be carried out in a scientific manner and the results published for our guidance. We should also like to know how these materials compare as to other factors such as thermal conductivity, color life, chemical stability and tissue tolerance. These tests should be made by some disinterested agency such as the Research Commission of the American Dental Association and certain minimum specifications for denture base materials should be adopted as standard.

424 Hamilton Building.

SIMPLICITY IN ORTHODONTIC MECHANISMS WITH SPECIAL EMPHASIS ON THE ROUND LABIAL ARCH*

By CLARENCE W. KOCH, D.D.S., Little Rock, Ark.

A PERUSAL of the orthodontic literature of the past reveals the intense growing pains that must have attended the development of orthodontics to its present state of perfection—pains that were certainly not always borne by the orthodontist. For witness, the iniquitous devices conceived for the purpose of regulating the teeth in the good old days. (Fig. 1.) In Figure 2, note the expression of blissful expectancy on the face of the young lady at the left (probably at the beginning of treatment), which, as treatment progresses, fades into an expression of wonderment and beginning apprehension, and finally (at the close of the seven years' war) culminates in an expression that would make a fitting cover page picture for the song, "The Curse of a Breaking Heart." Does not her expression reflect the indictment, "You made me what I am today"? But, contrary to the hope expressed in the song, we were not satisfied. While the refinement of appliances proceeded at a relatively rapid rate, the diabolical nature

*Read before the Section on Orthodontia at the Seventy-Sixth Annual Session of the American Dental Association, St. Paul, Minn., Aug. 9, 1934.

of our craft would not be outdone, for it was discovered, and I quote from a textbook published as late as 1919, that "with a grass line or rubber ligature, the spiral arch cannot be abused, as force placed on the arch with a knot cannot be drawn tight enough to do the arch any harm."[1] They no doubt expected nature to take care of the teeth.

Evidently, too, there were speed demons among our predecessors, even though they had never heard of the automobile or the aeroplane; for, in a text-

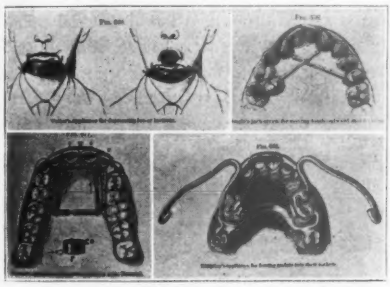


Fig. 1.—Orthodontic mechanisms of pioneer days.

Fig. 2.—Symbolic group of faces showing the characteristic expressions of three stages of pioneer orthodontic treatment.

book, published in 1897, I find described a method for the "Immediate Regulation of Inlocked Teeth." Goddard[2] quotes L. C. Bryan, as follows:

The treatment which I have finally adopted is to inject cocain, and either partially cut away the thick intervening alveolar process with drills and fissure burrs, or, when the process is thin, bodily wedge the alveolar wall away with a half-round wedge-shaped chisel, by inserting the point of the instrument between the crown and the bone, and forcing it up along the root until enough space is secured for the tooth to be brought out into place, outside the lower tooth.

The latter was accomplished by the use of forceps (Fig. 3) specially made for the purpose.

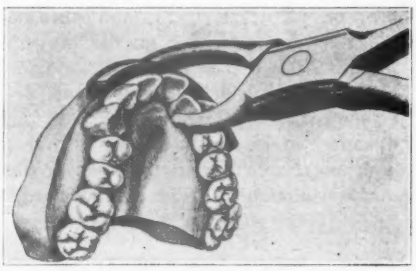


Fig. 3.—Speedy process of regulating teeth as advocated by one writer in the nineties.

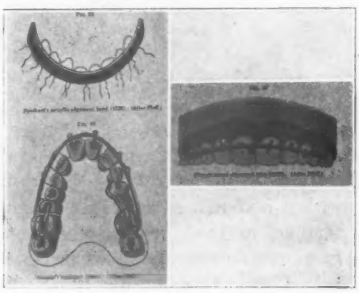


Fig. 4.—Prototypes of present-day appliances. Left: above, alinement band of Fauchard, 1728; below, appliance by Schange, 1840. Right: Flagg's alinement wire, 1865.

It may appear that these things are presented to you in a spirit of ridicule, but such is not the case. The purpose is merely to emphasize once again the crude

1. Canning, Edward: Orthodontia, Denver: Dental Specialty Co., 1919.

2. Kirk, E. C.: Operative Dentistry, Philadelphia: Lea Bros. & Co., 1897.

beginnings, and the rapid strides that have been made for refinement and simplicity in the construction of orthodontic mechanisms; a simplification that consisted not so much in the invention of new mechanical principles, as it did in the refinement of the principles known to some of the pioneers.

The round labial arch is perhaps the oldest appliance in use today. Since the wisdom of the ages has been brought to bear on its development, and since so much has been written on the subject, there is little that is new and novel for presentation. A brief review of its development, and a few remarks as to the dynamics of its use, might be in order. The labial arch had its inception in the metallic alinement band of Fauchard,[3] used as early as 1728, and shown in the upper left corner of Figure 4. In the lower left is shown an appliance designed by Shange[3] in 1840, which, while crude in form, uses principles that are in use today. The picture on the right (Fig. 4) shows Flagg's[3] alinement wire (1865). This appliance really marks the introduction of the round labial alinement wire, which, after passing through a series of modifications, received its greatest simplification and improvement at the hands of Edward H. Angle,[3] in 1887. Despite the simplicity of the principles embodied in this appliance, it was not universally accepted, and there was a reversion in some quarters to more complicated types. But the round labial arch as handed down by Angle in 1887 (Fig. 5) is essentially the same as the round labial arch of today. This process of simplification seems to have had its inception coincidently with the unraveling of the chaotic methods then in use in orthodontic diagnosis.

The prevailing opinion of the era being that all that could be said had been said about orthodontic diagnosis, naturally attention was turned to the problem that was the next most immediately vexatious: the difficulty of manipulating appliances. This resulted in the invention of many new appliances, and while this was laudable *per se*, like so many good things it was carried to the extreme. There was a time when we seemed to be more eager to try out a new appliance than we were willing to apply ourselves to the mastery of the principles of those appliances already at our disposal. In our eagerness to be modern, and because of a consuming desire for a panacea, many of the finer points of treatment were overlooked, in anticipation of the day, I suppose, when some genius would invent the appliance of our dreams, one that would require little intelligence, no skill or previous training and, most important of all, no effort to correct malocclusions of the teeth.

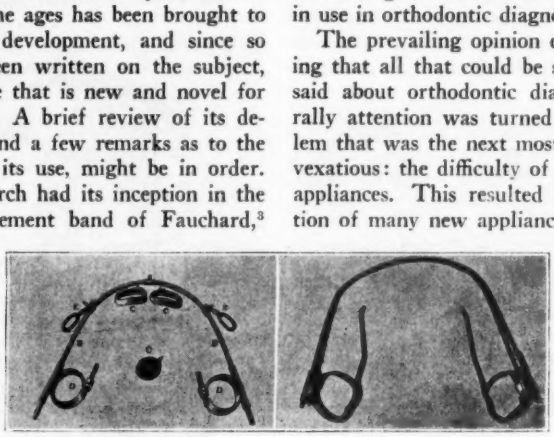


Fig. 5.—Left, Angle's round labial arch, 1887. Right, present-day round labial arch. The slight modification of the present-day appliance is evident.

3. Lischer, B. E.: Principles and Methods of Orthodontics, Philadelphia: Lea and Febiger, 1912.

Many times, we could almost feel the pot of gold at the end of the rainbow within our grasp, but when the mist cleared, the beautiful multicolored ribbon also vanished. Many times, the round labial arch was jolted from the pinnacle of popular acceptance by a new device, clothed in brighter array, and more bountifully endowed with little tricks. After all, simplicity is never attractive until you have been victimized by the duplicity of the delicately beautiful. There even was a time when one looked about him circumspectly and spoke in a hushed breath before confessing to the use of the round labial arch, lest the charge of "old fashioned" be hurled at him. But, through all these changes, the round labial arch is still

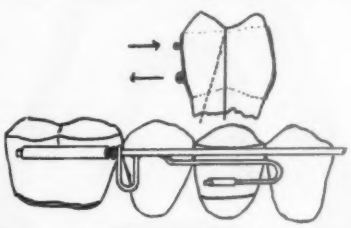


Fig. 6.—Simplified tilting mechanism as applied with round labial arch.

with us, and more firmly entrenched now than ever. The improvement in our noble metal alloys, and more recently, the chrome alloys, has contributed much to appliance construction, the details of which are well known, and about which much has been written.

While it is the intent of this paper to emphasize the usefulness of the round labial arch, it is not the intent to minimize the usefulness of any other appliance. Each has its place, of course. After all, it matters little which appliance is used, so long as its manipulation is thoroughly understood by the operator. The practice of using one system to the exclusion of all others has all but lost favor, and the progressive and conscientious orthodontist modifies them, or selects the one that best serves his purpose for the case in hand. But is it not true that when we find ourselves in a difficult position through the use of more complicated types of appliances, we almost instinctively turn to the round labial arch to help us out of our troubles? Why is this? Is it not because we realize that, with this appliance, we have a more simple control of force, and a more complete knowledge of the action and the reaction that is being created? This brings to mind a statement by Korbitz[3] of such importance that Dr. Lischer asked us, as undergraduate students, to

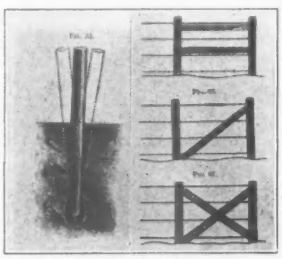


Fig. 7.—Comparison of tilting movements with bodily movements. The illustrations on the right represent the terminal ends of a wire fence. In the upper picture, the terminal posts are united by parallel bars, which permit a hinge movement. It is readily apparent that the resistance thus obtained is in no way comparable to the stability created when the terminal posts are braced as the center or lower pictures indicate.

memorize it: "The art and difficulty of orthodontic technic does not consist in the production of the acting forces, but in the advantageous utilization of the resistances present."

It is, of course, obvious that any point where the appliance attaches to the teeth or produces pressure on the teeth is a

resistance point. The evaluation of these resistance points is the difficult problem, because they are never quite the same; not even in corresponding areas of the same jaw. Often, the evaluation placed on them in the beginning of treatment must be modified as the treatment progresses. Disregard for this fact or failure to recognize it may explain why some cases that are considered very simple at the beginning of treatment develop into such complicated types as treatment progresses. The diversity and variation of the surrounding osseous structure, the fibrous attachments of the teeth, the type and direction of movement, all influence the quality of resistance. Stationary or

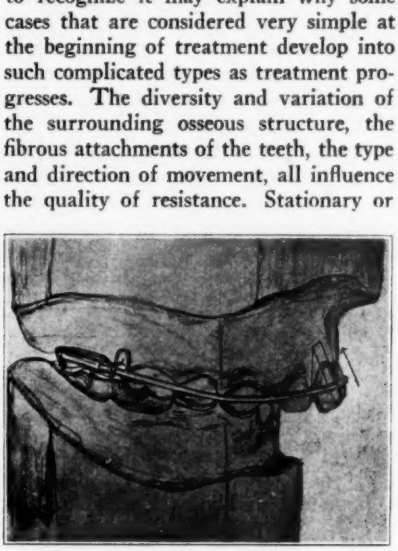


Fig. 8.—Type of case wherein anterior teeth may act as inclined plane. If provisions are not made to prevent it, when a distal force is applied the labial section of the arch moves gingivally, causing a tilting of the molars.

fixed resistance, or anchorage, whatever we choose to call it, is a relative term. It exists only as long as the aggregate force, which is delivered from it as a base, does not exceed the resistance of the anchor point.

It is much the same with reciprocal anchorage, as it is truly reciprocal only as long as one force does not overbalance the other. Hence, orthodontic treatment consists of a constant juggling of the stronger against the weaker resistance points, and as the number of these resistance points that are simultaneously active are increased, and as the variety of types and directions of movements are increased, the appliance becomes more complicated. It becomes more difficult to trace its action and reaction because the forces are moving through so many planes. Therefore, it is highly important that appliances be kept simple, so that all forces are constantly under the ready control and observation of the operator, remembering Newton's third law, "To every action, there is an equal and opposite reaction." The simplicity of control

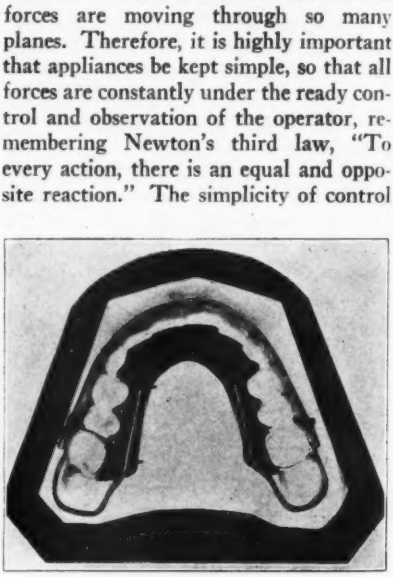


Fig. 9.—Vulcanite biteplate as developed by Andrew F. Jackson.

which is inherent in the round labial arch, and the fact that the force created by it is so obvious, justifies the prominent position it holds in the orthodontic armamentarium.

The unmodified round labial arch is merely a tilting mechanism, but, by banding the teeth and soldering the desired attachments (tubes or hooks) thereto, and by the addition of spurs or springs to the labial arch, or in combination with lingual appliances, practically any type of movement is possible with this appli-

ance. Where a general bodily movement is desired, another type of appliance might be preferable. Occasionally, cases arise wherein just one or two teeth need bodily movement. I have in mind a case in which general expansion was produced by means of a lingual appliance, using a round labial arch as a mold, so to speak, to limit the action of the auxiliary springs, the patient coming from quite a distance. For some reason, the upper left first bicuspid tilted very noticeably toward the buccal aspect. It was a simple matter to band this tooth, and with the aid of a spring soldered to the labial arch, the tooth is being tilted into its proper position. This simple mechanism is shown in Figure 6. There are cases wherein the available anchorage is not sufficient to withstand a bodily movement of, for

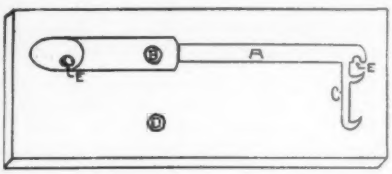


Fig. 10.—Apparatus simulating conditions under which intermaxillary elastics are worn in mouth. *A*, alinement wire, balanced and pivoted at *B*. *C*, intermaxillary hook of variable length. *D*, molar intermaxillary hook. *E*, niches for application of small scale.

example, the six anterior teeth. This problem can usually be solved by tilting the teeth into the desired position, and then, by the addition of the attachments referred to above, they can be given their proper vertical inclination. In effect, they will have been moved bodily, but, actually, merely two tilting forces have been used. It is readily apparent that these forces do not produce as much distal displacement on the anchorages as would a direct bodily movement. Figure 7, from Dr. Case's book, clearly illustrates this principle.[4] The illustrations on the right represent the terminal ends of a wire fence. In the upper picture, the terminal posts are united by parallel bars, which permit a hinge movement. It is readily apparent that the resistance thus obtained is in no way comparable to the stability created when the terminal posts are braced as the center and lower pictures indicate.

There are times when tilting forces can work to a disadvantage. I refer to the type of case wherein the anterior teeth have a pronounced labial inclination. An early experience in my orthodontic career with this type of case taught me something about the pranks that hidden forces sometimes play. (Fig. 8.) In this case, it is desirable to move the anterior teeth lingually. The natural tendency, when the distal force is applied, will be for the labial arch to travel gingivally, and, in so doing, tilt the molars. This occurs because the anterior teeth act as an inclined plane. This is easily prevented by soldering spurs to the arch that engage the incisal edges of the teeth, and then not using too much force, which will cause both a tilting of the molars and a depression of the anterior teeth.

One of the finest contributions to the value of the round labial arch, and a contribution that has opened up a much wider range of usefulness for this appliance, was made by Andrew F. Jackson,[5] when he introduced the vulcanite biteplate (Fig. 9) that attaches to the molar buccal tubes by means of a clasp coming

4. Case, C. S.: Practical Treatise on Technics and Principles of Dental Orthopedia and Prosthetic Correction of Cleft Palate, Chicago: C. S. Case Co., 1921.

5. Jackson, A. F.: Nature and Place of Mechanical Interference in Orthodontic Treatment, D. Cosmos, 73:950 (Oct.), 1084 (Nov.), 1162 (Dec.) 1931. Method of Treating Cross-Bite, Internat. J. Orthodontia, 20:467 (May) 1934.

around the posterior surfaces of the distal teeth. This biteplate can be worn with the appliance and with intermaxillary elastics in position for vertical development, but can be removed by the patient when eating; which eliminates a very serious objection to bite planes. I find it a most useful device.

Recognizing that, with an intermaxillary elastic, a force of from 3 to 4 ounces is created, while the average force of an 020 auxiliary spring is approximately only from 1 to 1½ ounces, I felt that I should know more about the forces of intermaxillary elastics. Therefore, I recently conducted certain experiments, which I report here. The results are not final at all, but I hope that this report may stimulate further investigation of their action. An apparatus was made simulating the conditions under which intermaxillary elastics are worn in the mouth. Bar *A* represents the alinement wire, balanced and pivoted at *B*. *C* represents an intermaxillary hook of variable length, and *D* the molar intermaxillary hook. At *E* are niches for the attachment of a small scale.

Figure 11 shows the manner in which these forces were measured. The results of these experiments are shown in Figure 12.

At *A*, the elastic is worn in the conventional distoclusion manner. A 1¾

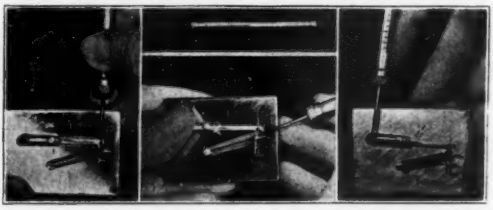


Fig. 11.—Manner in which the force of intermaxillary elastics was measured. Left, downward pull. Center, above, scale used; below, mesiodistal pull. Right, tilting force in molar region.

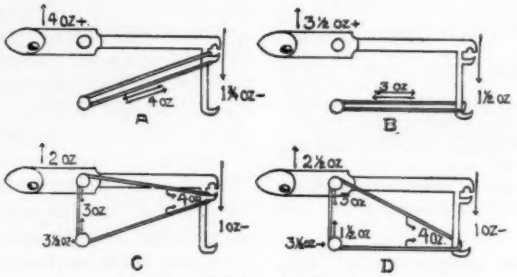


Fig. 12.—Results of experiments.

ounce downward pull was exerted at the labial section of the arch; a 4-ounce mesiodistal pull, and a 4-ounce plus tilting force in the molar region. With such force, the wonder is not that molars tilt, but that they do it so seldom. At *B*, the intermaxillary hook is merely lengthened, and while the forces are diminished slightly, they are no more favorable. At *C*, the intermaxillary elastics are placed

in a triangular position. The tilting force has been diminished by more than half, and the downward pull in the labial section by almost that much. Yet, the desirable force, the mesiodistal force, remains practically constant. I would not at this time wish to make a positive statement, yet I am beginning to doubt that vertical development can be produced in the posterior region of the jaw by the triangular application of intermaxillary elastics, without using as an adjunct some mechanical means of keeping these teeth out of occlusion. It is for this reason that I believe the 3-ounce vertical contraction at the molar regions in *C* may be regarded as less serious than the other unfavorable forces of intermaxillary elastics, when worn as shown in *A*. It would seem from this experiment that the triangular application might be more favorable in the correction of mesiodistal relations of the jaws. At *D*, the intermaxillary hook is merely lengthened

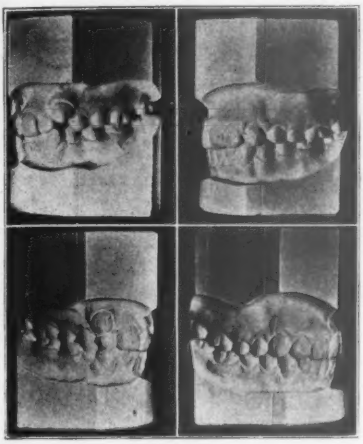


Fig. 13.—Case in girl, aged 12 years, with diagnosis of complex neutroclusion. Left, lateral views of case before treatment. Right, appearance after treatment.

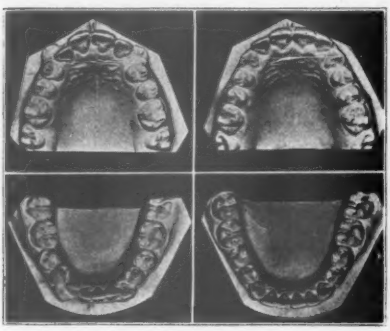


Fig. 14.—Occlusal views of case shown in Figure 13.

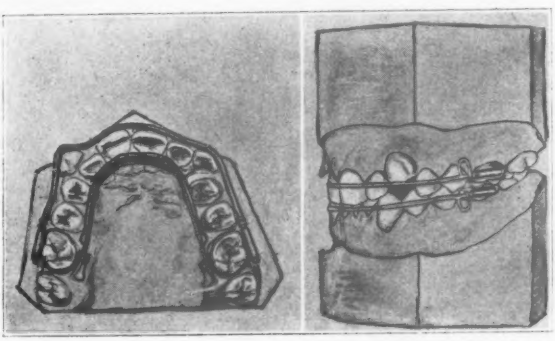


Fig. 15.—Appliances used in treatment of case shown in Figures 13 and 14.

again, and no particular advantage is seen from this procedure.

Figures 13-15 show the case of a girl, aged 12 years. The diagnosis, briefly, and in accordance with the accepted nomenclature, is that of complex neutroclusion. Treatment consisted of expanding the jaws laterally and in the anterior portion. The appliances (Fig. 13) were

Fig. 16.—Case in boy, aged 14 years, with diagnosis of unilateral distoclusion complicated by labioversion of upper anterior teeth and loss, just previous to treatment, of upper right permanent first molar. Left, right lateral view at beginning of treatment. Center, second molar moved into position of first molar and labioversion corrected. Right, third molar moved into position of second molar and case completed.

Figures 16-17 show the case of a boy, aged 14 years, diagnosed as unilateral distoclusion, complicated by labioversion of the upper anterior teeth and the loss, just previous to beginning treatment, of the upper right permanent first molar. The appliances were an upper labial arch and a lower lingual arch. An intermaxillary elastic was used on the right side. The right second molar was moved mesially by ligation from the distal end of the buccal tube through a u-shaped spring stop on the labial arch. The center view shows the second molar moved into the

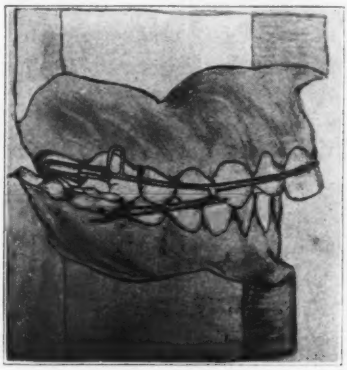


Fig. 17.—Simplicity of appliance used in treatment of case shown in Figure 16.

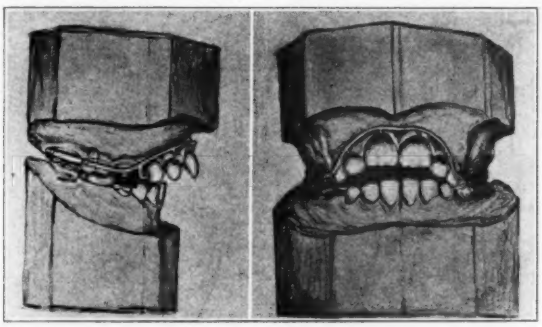


Fig. 18.—Appliances used in treatment of case shown in Figures 19 and 20.

a labial arch on the upper and lower jaws, together with lingual appliances with auxiliary springs. The labial arch is used to check the action of the auxiliary springs. Results of treatment are shown at the right in Figures 13 and 14.

position of the first molar, and the labioversion corrected. The view on the right shows the finished case. The third molar now occupies the position of the second molar. Figure 17 is a drawing of the appliance used.

Figures 18-20 show the case of a girl, aged 9 years, diagnosed as mild bilateral distoclusion, complicated by infraversion and pronounced labioversion of the upper anterior teeth. The appliances used were an upper modified high labial arch, with 022 spurs soldered at the central and lateral incisor positions, and just long enough to engage the teeth gingivally to the crest of their morsal curvature. By a gentle downward pressure, produced by a slight bending of the labial arch, and augmented by the downward pull of the intermaxillary elastics, the teeth were moved into the positions shown in Figures 19 and 20 at the right.

The purpose of this article is not to recite and illustrate all the many applications of the round labial arch. Most of this should be common knowledge. At least, enough has been written on the subject to make it so. Rather, its purpose is to reawaken interest, if it has waned, in the simple, yet one of the most useful, appliances at our disposal. If you wish to refresh your memory on this subject, I refer you to McCoy's "Applied Orthodontia,"[6] the writings of Jackson,[5] Ford,[7] Lischer,[8] Lourie,[8] Oliver,[9] Wood[9] and others.

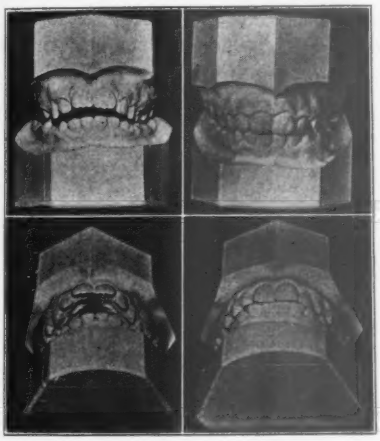


Fig. 19.—Case in girl, aged 9 years, with diagnosis of mild bilateral distoclusion, complicated by infraversion and pronounced labioversion of upper anterior teeth. Left, case at beginning of treatment. Right, case at completion of treatment.

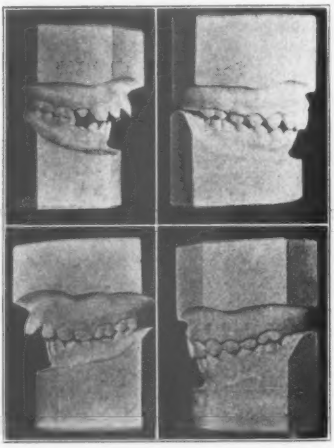


Fig. 20.—Case shown in Figure 19. Left, case at beginning of treatment. Right, case at completion of treatment.

6. McCoy, J. D.: Applied Orthodontia, Philadelphia: Lea and Febiger, 1931.

7. Ford, J. W.: High Labial Arch Technic and Some Results, Proc. First Internat. Orthodon. Cong., 1927. High Labial Arch, Proc. 30th Ann. Meet. Am. Soc. Orthodontists, 1931.

8. Lourie, L. S.: Some Forms of Spring Extensions for High Labial Arch, Proc. Ann. Meet. Am. Soc. Orthodontists, 1929.

9. Oliver, O. A., and Wood, C. R.: Principles Involved in Lingual and Labial Arch with Auxiliary Spring Attachments, Proc. 2nd Internat. Orthodon. Cong., 1931. Oliver, O. A.: Technic of Lingual and Labial Arches, Proc. 27th Ann. Meet. Am. Soc. Orthodontists, 1928.

While no one can deny the importance of the mechanical principles involved in tooth movement, I wonder if we have not erroneously laid too much blame for our shortcomings at the door of appliances, rather than at the door of diagnosis. Many times, knowing what you want to do is more difficult than doing it, after you know what you want to do. Hence, the simplicity of design in orthodontic mechanisms is directly dependent on a definite knowledge of the objective of treatment. I consider a diagnosis as consisting of (1) a clear cut chart, showing the latitude, longitude and altitude, if you please, that the teeth and jaws occupy in the universe of the head, and the influence they exert on facial form; (2)

Fig. 21.—Gnathostatic model (left) versus plain model (right). Certainly as much information is contained in the former as in the latter, and it may contain additional information of great value.

the positions they should occupy in order to afford the greatest usefulness, and the most pleasing appearance to the patient, and (3) the planning of the most direct route by which they can be placed in their new positions, and the evaluation of the obstacles likely to be encountered on the trip.

They tell a story about Columbus. The story is rather old, but to the point. It is said that when he set out on his epochal journey, he didn't know where he was going; when he got over here, he didn't know where he was, and, when he returned home, he didn't know where he had been. The inference is obvious. We move teeth from positions we know not where, into places we know less about, and when we are all through, we don't know what we have done. Carrying the analogy of Columbus a little farther, you will recall that despite the hours Columbus had given to studying the facts relating to his voyage, the contemporary learned gentry scoffed at his idea and seriously questioned his mental stability. I suspect that they must have realized the wisdom of his undertaking, and that the real basis of their derision lay in the fact that he had thought of it before they had.

In 1924, a new system of diagnosis

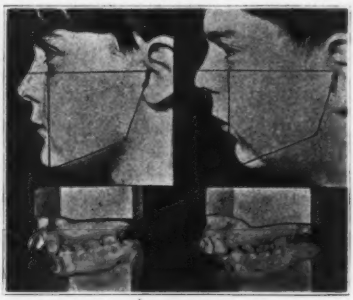


Fig. 22.—Two interesting cases having very similar dentures, but wherein extent and degree of anomaly shows a wide variance. If judged by the Angle classification of malocclusion, both of these cases would have been designated as Class 11, Division 1. In the case on the left, the anomaly is limited to the denture, there being a definite protraction of the upper incisors (anterior dental protraction), with a retraction of all the lower teeth which did not extend beyond the alveolar portion of the lower jaw (total alveolar retraction). In the case on the right, there is likewise a definite protraction of the incisors and a retraction of all the lower teeth which extends beyond the boundaries of the denture, and involves the mandibular structures (total mandibular retraction).

was presented to the American Society of Orthodontists. Not a perfect system, but

a very definite aid, and an advance over older methods in that it gave us a practical three-dimensional method of studying malocclusion. I suppose it was a great while after the compass was given to the mariners of old that the magnetic variation or declination of the needle in various parts of the earth was understood. I dare say that this lack of understanding threw these ancient mariners off their course at times, but this did not cause them to discard the compass. Rather, they used it as if it always pointed due north, and set about finding the cause and the degree of variation, after which it became a still more useful instrument. So it is with the Simon gnathostatic system of diagnosis.[10] It is recommended that it be used as if certain lines always fall through certain anatomic points. It is well known that there is an anatomic variation, but, even in its present development, it is an advantage to use the system for the aid it affords. Later, we may learn more about these variations. Certainly, gnathostatic models will reveal as much information as the former type (Fig. 21), and you may find virtues in its that you had not thought possible. The same is true of photographs. It requires no more time to take them photostatically than the regular way. Many orthodontists draw various lines on their photos as diagnostic aids, some in accordance with a definite system of their own, others by intuition. Photostatics is at least a definite system, if it is nothing more. Figure 22 is taken from McCoy's "Applied Orthodontia."[6] A study of this illustration alone should motivate the most ardent skeptic to give gnathostatics at least a fair trial.

Figure 22 shows:

Two interesting cases having very similar dentures, but wherein the extent and degree of the anomaly shows a wide variance. If judged by the Angle classification of malocclusion, both of these cases would have been designated as Class II, Division I. In the instance upon the left, the anomaly is limited to the denture, there being a definite protraction of the upper incisors (anterior dental protraction), with a retraction of all the lower teeth which did not extend beyond the alveolar portion of the lower jaw (total alveolar retraction). In the case upon the right, there is likewise a definite protraction of the incisors and a retraction of all the lower teeth which extends beyond the boundaries of the denture, and involves the mandibular structures (total mandibular retraction).[6]

When it is definitely known, within reasonable limits, to which positions teeth or jaws are to be moved, the problem of constructing an instrument to produce these movements becomes a relatively simple matter. It is only when we are floundering, when, as a result of a careless diagnosis, our visualization of the finished case is somewhat hazy, that appliance construction takes on such huge and distorted proportions.

To summarize, permit me to suggest that:

1. We master the principles of a few appliances, rather than become a slave to many, remembering that complexity of design often points suspiciously to a lack of understanding.

2. The fewer the planes through which we move teeth at any one given time, the more easily are the forces controlled and observed.

3. We refrain from moving teeth until we have a reasonably clear and concise mental picture of the final result we wish to obtain, realizing that a reasonably correct diagnosis is indispensable.

4. Simplicity in the construction of orthodontic mechanisms runs parallel to

10. Simon, P. W.: Fundamental Principles of Systematic Diagnosis of Dental Anomalies, Boston: The Stratford Co., 1926.

the degree with which we understand the problems to which they are to be applied.

5. Because of its inherent simplicity, the round labial arch occupies a very useful place in the orthodontic armamentarium.

817 Donaghey Building.

DENTAL CARIES AND PARADENTAL DISTURBANCES: I. IMPORTANCE OF AN ADEQUATE DIET FOR HEALTH OF TEETH AND PARADENTIUM*

By HERMANN BECKS, M.D., D.D.S., and NINA SIMMONDS, Sc.D.,
San Francisco, Calif.

DISTURBANCES in mineral metabolism and vitamin deficiencies have received much attention in recent years as factors in tooth decay and disease of the paradental tissues. Many excellent reviews on the various theories of the cause of dental caries have appeared.[1] As these give extended bibliographies, a review of the literature is unnecessary.

A study of recent reports leads one to wonder whether there is not a tendency for many investigators to attempt to explain the etiology of caries on the basis of only one or at most two conditions; for instance, faulty nutrition or faulty nutrition combined with the presence of *B. acidophilus* in the mouth; or environmental conditions alone or together with some physiologic condition. Does not the present state of our knowledge leave much doubt as to our ability to prevent or arrest decay by one means alone? We question whether there ever will be a universal panacea which will result in the prevention or arrest of tooth decay or paradentosis (pyorrhea), such as vitamin D or calcium. So long as no definite etiologic bases have been found for these conditions, attention must be given not only to the symptoms in the oral cavity, but also to the general well being of the patient. A large number of clinical data must be obtained before any relationship of dental decay to dietary deficiency or disturbance in metabolism can be established. A detailed study must be made of each patient, and the data thus obtained are of value only when coordinated with a broad program.

The study of dietary habits of patients suffering from dental decay is only part of such a program, but in the light of the advancement of our knowledge in the field of nutrition, it is a very important one. Most investigators seem agreed on

*Read in part by Dr. Becks before the Pasadena District Dental Society, Nov. 13, 1934.

*From the George Williams Hooper Foundation for Medical Research and the College of Dentistry, University of California.

*Research conducted under grants made by the University of California College of Dentistry, California State Dental Association, California Academy of Periodontology, Board of Research, University of California and Good Teeth Council for Children, Inc.

1. Cowgill, G. R.: D. Cosmos, 76:223 (Feb.) 1934. Enright, J. J.; Friesell, H. E., and Trescher, M. O.: J. D. Res., 12:759 (Oct.) 1932. Koehne, Martha; Bunting, R. W., and Hadley, Faith P.: J. Am. Dietet. A., 9:445 (March) 1934. Koehne, Martha, and Bunting, R. W.: Ann. Rev. Biochem., 3:441-458, 1934. Eddy, W. H.: J. New York Acad. Dent., 1:15 (June) 1934.

this point, but still are not able completely to eliminate caries in children who have received improved diets. Is this due to a failure to analyze each child individually for possible (exogenous and endogenous) conditions which may have a direct bearing on caries? For instance, if a person with rampant decay who has been taking a poorly balanced diet for many years is found to be suffering from hypothyroidism, which is known to be

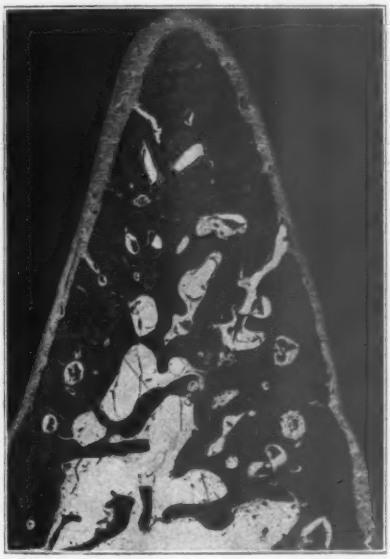


Fig. 1.—Normal bone structure under bifurcation of premolar of dog. The marrow cavities are small and physiologic resorption is compensated by new formation of bone. (Spec. No. 998 A.) (Microsummar, 42; extension of camera, 33 inches; distance from object, 4 cm.)

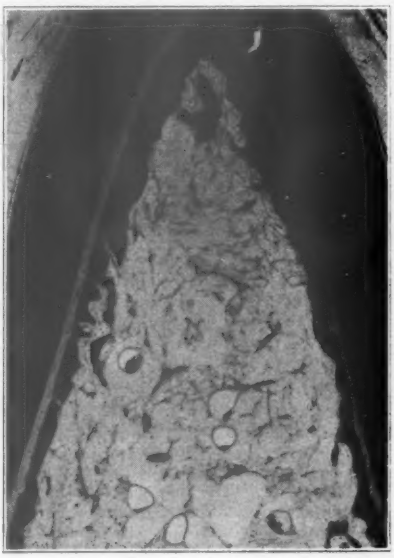


Fig. 2.—Bone structure under bifurcation of premolar of dog, with loss of "supporting bone" (trabeculae), which is replaced by fat marrow. The diet, with normal salt mixture but lacking in Vitamin D, led to severe "osteoporosis." (Spec. No. 2056.) (Microsummar, 24; extension of camera, 20 inches; distance from object, 1.5 cm.)

associated with rampant decay, it would hardly be justifiable to assume that correction of the diet alone would stop the decay. In other words, correction of both the diet and the endocrine unbalance would be required to bring the patient up to par and perhaps arrest decay. A failure on the part of some investigators to recognize the possibility of such relationship naturally has very unsatisfactory results.

The etiology of caries and the factors in paradentosis are undoubtedly very complex, having different aspects in different persons. Treatment and prevention, therefore, depend on the isolation of all factors in each case and their proper disposal. This means individualization in investigation and treatment.

For a number of years, one of us (H.B.) has been engaged in problems dealing with bone pathology. In the course of a study on the effect of acid,

neutral and basic diets on the osseous and dental structure of dogs, conducted by the California Stomatological Research Group of the University of California,[2] it was found that von Recklinghausen's disease, or osteodystrophia fibrosa, with pseudotumors and cysts in the jaws, was produced in some animals by diet alone.[3] The diet responsible for these severe changes contained a salt mixture which was low in calcium and relatively high in phosphorus (owing to the low calcium content of the mixture) and contained no cod liver oil. In other dogs, which received a diet containing an adequate salt mixture without the addition of cod liver oil, a severe osteoporosis of the jaw bone (Askanazy's "progressive bone atrophy") was produced.

Figure 1 shows normal bone structure under the bifurcation of a bicuspid of a dog protected against mineral and vitamin deficiency. The bone is quite compact, with fairly small marrow cavities. Balance between new formation of bone and physiologic resorption is maintained.

Figure 2 shows the alveolar structure under the bifurcation of a premolar of a dog which received a diet containing an adequate salt mixture, but no cod

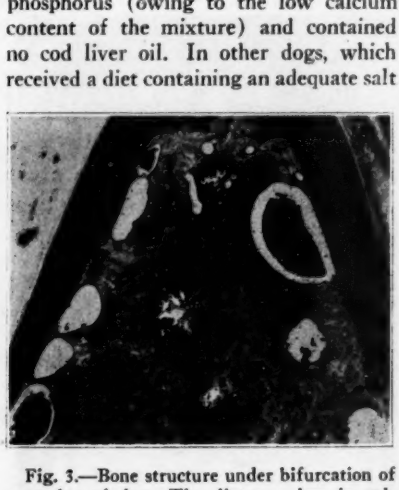


Fig. 3.—Bone structure under bifurcation of premolar of dog. The diet was low in calcium, without the addition of cod liver oil. The original bone structure was replaced by fibro-osteoid tissue with a large number of cysts. The marrow cavities were filled with blood and fibrous tissue. Diagnosis: Osteodystrophia fibrosa with cystic development in the jaws. (Spec. No. 1795.) (Microsummar, 42; extension of camera, 31 inches; distance from object, 1½ inches.)

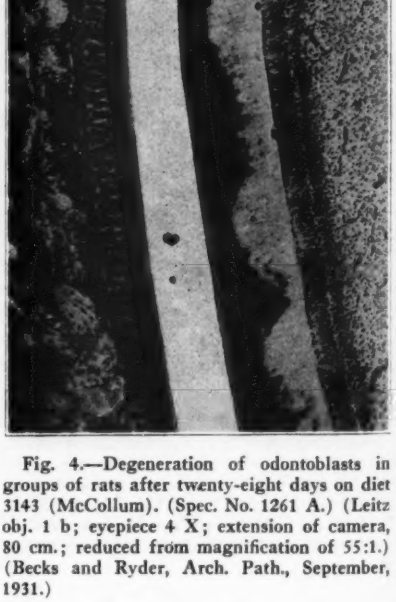


Fig. 4.—Degeneration of odontoblasts in groups of rats after twenty-eight days on diet 3143 (McCollum). (Spec. No. 1261 A.) (Leitz obj. 1 b; eyepiece 4 X; extension of camera, 80 cm.; reduced from magnification of 55:1.) (Becks and Ryder, Arch. Path., September, 1931.)

2. Morgan, A. F.: Univ. Calif. Pub. Physiol., 8:61, 1934.

3. Becks, Hermann, and Weber, Moritz: Influence of Diet on Bone System with Special Reference to Alveolar Process and Labyrinthine Capsule, J.A.D.A., 18:197 (Feb.) 1931. Becks, Hermann, and Fleming, W. C., to be published.

liver oil. The trabeculae have disappeared entirely and only the lamina dura is left. The supporting bone is replaced by fat marrow and the blood capillaries are greatly enlarged.

Figure 3 shows the osseous structure under the bifurcation of a premolar of a dog fed a diet containing a salt mixture low in calcium (relatively high in phosphorus, owing to the low calcium content of the mixture), without the addition of cod liver oil. It can be seen that the original osseous structure is entirely replaced by a deficient uncalcified tissue which is fibro-osteoid. Marrow cavities are filled with blood. The resorptive process is markedly increased and the peridental membrane has disappeared entirely.

These experiments in dogs have shown that diets of various composition can have a definite influence on the formation and destruction of bony tissue. In dogs, lack of vitamin D in the food will lead to a progressive bone atrophy (osteoporosis) and, if there is also a lack of calcium salts, osteodystrophic changes develop (Fig. 3). McCollum, Simmonds, Shipley and Park[4] reported that diets low in calcium, high in phosphorus and low in vitamin D produced marked evidences of bone resorption in rats.

In other experiments, McCollum and his co-workers[5] found that, in rats, a diet high in calcium and relatively low in phosphorus and vitamin D (diet 3143) produced definite rachitic bone changes. They reported from their histologic examinations of the tibiae of these rats that there was little resorptive activity, but merely the formation of uncalcified bone. Becks and Ryder[6] examined the teeth of rats fed on this diet and found a degeneration of the odontoblasts in groups (Fig. 4). The calcification of the dentin continued only in those areas where vital odontoblasts were present. Even though a generous amount of calcium was present in the diet, normal dentin could not be formed, owing to a deficiency of phosphorus and vitamin D.

If the findings of these experiments are compared from the standpoint of bone pathology, it will be seen that diets low in calcium and high in phosphorus and diets high in calcium and low in phosphorus, both without the addition of vitamin D, lead to very different pictures of bone and tooth formation.

In the dog, a diet low in calcium, high in phosphorus and low in vitamin D leads to a tremendous resorptive activity within the osseous structure, resulting in osteoporosis and osteodystrophia fibrosa. A diet of similar composition, when fed to rats, also produced marked evidence of bone resorption. Diets high in calcium and low in phosphorus and vitamin D produced marked rickets in rats and also partial degeneration of the odontoblasts, accompanied by little evidence of osteoclastic activity.

The changes produced in these animals were so striking that the question arose as to whether certain pathologic processes of the osseous structure in paradentosis in human beings were part of a generalized disturbance, perhaps the result of a dietary deficiency. For this reason, dietary histories of about 100 patients showing varying degrees of bone atrophy were taken by one of us (N.S.). It was found, in numerous instances, that patients had, for many years, been taking a diet that was incomplete from a nutritional standpoint. Low calcium and low vitamins B, C and D were the outstanding characteristics, and in but few instances were other constituents present in

4. McCollum, E. V., et al.: Am. J. Hyg., 1:492 (July) 1921.

5. McCollum, E. V., et al.: J. Biol. Chem., 47:507 (Aug.) 1921.

6. Becks, Hermann, and Ryder, W. B.: Arch. Path., 12:358 (Sept.) 1931.

optimum amounts. A few of the patients were taking a diet which, though it was not optimum in all factors, was not sufficiently inadequate that it could be said to be the sole cause of the disturbance. This necessarily led to the conclusion that factors other than faulty diet must play an important rôle in the production of these bone changes. These investigations have not been completed as yet.

In the course of these dietary studies, which were supplemented by biochemical analyses of blood and saliva, many persons who had marked tooth decay were examined. Their diets were likewise found to be inadequate, in that a number of essentials were supplied in small quantities. It was, therefore, decided to extend our original investigation of the relation of dietary deficiencies to the clinical aspects of paradentosis, and to include the study of a large number of patients with rampant decay.

Mellanby and Pattison,[7] Boyd, Drain and Nelson,[8] Koehne, Bunting and co-workers,[9] McBeath,[10] Hess, Abramson and Lewis,[11] Tisdall, Anderson, Agnew, and co-workers,[12] Schoenthal and Brodsky[13] and Applebaum, Bödecker, Hollander and co-workers,[14] to mention only a few of the investigators in this field, have all reported studies of the incidence of caries in groups of children before and after being placed on regulated or standard diets. In all instances, it was noted that the caries incidence was less when the diet was improved. Space does not permit a more detailed discussion of these interesting studies. The original papers should be consulted. Several of the investigators mentioned stress the importance of vitamin D (obtained either from viosterol or ultraviolet light) in caries prevention. Their data show that the control groups were more subject to caries than those receiving added vitamin D. Even with liberal amounts of vitamin D in the form of viosterol, cod liver oil or ultraviolet light, 100 per cent freedom from decay was not attained. Good oral hygiene was practiced in most, if not all, of the studies reported. The failure to prevent caries in all instances emphasizes the point made earlier in this paper, that factors other than diet undoubtedly enter into some cases of dental caries. It also clearly illustrates the need for individualization. Each case must be studied as a unit, with a complete examination for possible relative factors.

It cannot be stressed too often that all persons working in the field of diet and its relation to dental problems should exercise extreme care in drawing far-reaching conclusions. Experiments of this nature should have controls just as animal experiments do. It is, for example, extremely difficult to understand the dietary studies on dental problems which have been made in recent years in Hawaii by Jones, Larsen and Pritchard.[15] A

7. Mellanby, May, and Pattison, C. L.: Brit. M. J., 1:507 (March 19) 1932.

8. Boyd, J. D.; Drain, C. L., and Nelson, Martha J.: Am. J. Dis. Child., 38:721 (Oct.) 1929.

9. Koehne, Martha, et al.: J. Nutrition, 7:657 (June) 1934; Am. J. Dis. Child., 48:6 (July), 47:988 (May) 1934. Bunting, R. W.: J. D. Res., 14:97 (April) 1934.

10. McBeath, E. C.: J. D. Res., 12:723 (Oct.) 1932; New York J. Med., 33:1086 (Sept. 15) 1933.

11. Hess, A. F.; Abramson, H., and Lewis, J. M.: Am. J. Dis. Child., 47:477 (March) 1934.

12. Tisdall, F. F., et al.: J. Pediatrics, 2:190 (Feb.) 1933. Anderson, P. G., et al.: Influence of Vitamin D in Prevention of Dental Caries, J.A.D.A., 21:1349 (July) 1934.

13. Schoenthal, L., and Brodsky, R. H.: Am. J. Dis. Child., 46:91 (July) 1933.

14. Hollander, Franklin, et al.: J. D. Res., 14:303 (Aug.) 1934.

15. Jones, Martha R.; Larsen, N. P., and Pritchard, G. P.: Am. J. Dis. Child., 45:789 (April) 1933; D. Cosmos, 76:395 (April) 1934; 72:439 (May), 574 (June), 685 (July), 797 (Aug.) 1930.

study of their work has recently been undertaken by A. J. Ker, of the University of California College of Dentistry, and a summary of a critical review will appear in THE JOURNAL.

They assert that the rampant disintegration of the newly erupted teeth of babies of certain nationalities in Hawaii is "an expression of a metabolic fault which is common to the community." From a study of their papers, the question may be raised as to whether they are dealing with a condition unique in Hawaii or whether the same inadequate diet (of the persons under investigation) taken over a period of years, together with the intense sunlight, would produce the same condition elsewhere. A diet consisting largely of rice and fish (with a preponderance of rice), with few vegetables and fruits, not only leaves an acid ash, but also is low in calcium.

When vegetables such as poi and sweet potatoes are substituted for rice, not only is the diet changed from an acid ash to an alkaline ash, but a rather generous amount of calcium (comparatively speaking) is added. This addition is significant in its relation to bones and teeth. The question of the assimilation or the retention of the available calcium, as the problem applies to babies and their dental conditions in Hawaii, is one to which Jones and her co-workers have not given sufficient attention. Is the calcium from poi more readily available to babies born of mothers whose diets have been inadequate for a number of years than is the calcium of milk? We have not seen any studies by Jones and her co-workers bearing on this point. Miller[16] found that taro (poi) contains about twice as much vitamin B as milk. When poi is fed, additional vitamin B is also given; which, in turn, may aid in the assimilation of the calcium.

16. Miller, C. D.: Bull. 37, Bernice P. Bishop Museum, Honolulu, T. H., 1927.

In a recent paper, Cowgill[1] summarizes the situation very well when he says:

> The views of Hawkins,[17] Jones, Larsen and Pritchard,[15] and others[18] that immunity to caries resides chiefly in ingestion of a base-forming diet, all assume the existence of some neutralizing mechanism acting from within, but fail to give a satisfactory picture of the precise mechanism. The remarkable ability of the organism to maintain an appreciably constant hydrogen-ion concentration in the blood leads one to doubt very much the adequacy of such an explanation.

Poi, a food long used in Hawaii, is a good source of calcium and phosphorus when it is used in generous amounts, as it apparently was by the early Hawaiians.[16] With plenty of sunshine, which in turn means abundant vitamin D, it is not strange that the early Hawaiians had excellent bones and teeth. Fish and other foods available furnished protein and the other necessary vitamins. The explanation offered by Jones and her co-workers that foods indigenous to a locality are best suited to the needs of persons living there postulates the assumption that the factors in an adequate diet vary with the locality. Poi happens to be a food which, when generously used, supplies fairly liberal amounts of calcium and phosphorus.

In addition, it may be said that if the solution of the problem of tooth disintegration in Hawaii is merely one of changing the diet from acid to alkaline, as stated by Jones and her co-workers,[15] and the minerals and vitamins have little to do with the prevention of the condition, it is not clear why sodium bicarbonate was not added in the place of poi,

17. Hawkins, H. F.: Dental Decay—What It Is and Means for Its Control, J.A.D.A., 16: 781 (May) 1929; What Is Cause of Caries and Systemic Pyorrhea? ibid., 18:943 (May) 1931.

18. Stern, A. R.: D. Cosmos, 73:1017 (Oct.) 1931. Horton, K.; Marrack, J., and Price, I.: Biochem. J., 23:1075, 1929.

fruits, vegetables and milk. Is the dental profession to understand that these workers believe the beneficial effects which they secured by the use of milk, fruit, poi and vegetables with an abundance of sunshine to be due solely to physical changes indicated by the shift of the urine from a markedly acid to a less acid reaction? In the light of modern nutrition studies, such a view is untenable.

We seriously question whether in Hawaii or elsewhere all dental problems can be solved by increasing the alkali reserve of the body by taking sodium bicarbonate. Undoubtedly, even Dr. Jones and her co-workers would not agree that the addition of sodium bicarbonate to a diet consisting largely of rice and fish would have the same effect on children and adults in Hawaii that the generous use of poi, fruits, vegetables and milk would have. In the light of their statements that calcium and phosphorus and vitamins have little to do with the condition, we are at a loss to understand their point of view.[15]

The experiments recently published[15] have not convinced us of the importance of a low alkali reserve in the production of bone disturbances. Until the Hawaiian group presents data showing that tooth decay (also odontoclasia) can be arrested or prevented only by the addition of sodium bicarbonate (to substantiate their theory that a high alkali reserve is essential in the tropics), we are unable to accept their work.

Another interpretation is tenable for the observations of Jones and her coworkers. Owing to the intensive sunshine, which, in turn, means an abundance of vitamin D, the diet of the pregnant woman and also of the population as a whole should contain an abundance of calcium as well as other factors. (There is the possibility, of course, that the excessive radiation produces its effects through factors other than vitamin D.) This was true when poi furnished such a large part of the food supply of the early Hawaiians. It is suggested that the high vitamin D makes for a very efficient utilization of the calcium available, and when persons are on a low calcium diet, they appear to be better nourished than they really are. This was shown to be the case in experiments conducted by Shipley, Park, McCollum and Simmonds[19] during their rickets studies.

Undoubtedly, the mothers of the infants who later develop odontoclasia or tooth decay very early are not so well nourished as would appear on casual examination. They are, it would seem, comparable to the persons studied by the late Dr. Goldberger in the pellagrous districts and described by him as in "that twilight zone of nutritional instability." In Hawaii, a low calcium intake, among other things, may bring about the "nutritional instability."

The diet formulated by Boyd, Drain and Nelson[8] has been used in a number of institutions for studies relating to tooth pathology. In our experience, it was not flexible enough for use in daily dental and medical practice. Patients often have rather firmly established food habits and certain dislikes which must be considered. For example, when persons have taken tea or coffee with their meals for years, we doubt that the majority can be depended on to substitute milk indefinitely, even if they expressed their willingness to do so at the time of the examination. Some adults do not like milk; others believe they cannot take it; still others want a hot drink with their meals, and they do not want cocoa. Comparatively few adults whose diets have been studied want to take even a pint of milk every day, but most of them appear

19. Shipley, P. G., et al.: Am. J. Hyg. 1:512 (July) 1921.

DIETARY HABITS

Name.....

Address.....Phone number.....

Place and date of birth.....

What number child are you in the family (1st, 2nd).....Nationality.....

Have you lived on a ranch, in a village or in a city during most of your life? (In some detail, including time factor).....

When a child, did your family have its own garden, cow, chickens and/or meat supply?.....

In your childhood, was your winter diet largely one of cooked foods?.....

What fresh foods were available for you?.....

Did you ever have growing pains (also called "muscular rheumatism") in childhood?.....

Have you any pronounced dislikes among foods?.....

If so, what foods?.....

Up to the present time, have you used the following foods in your diet generously, in average amounts, or sparingly?

Candy or other sweet foods.....

Fruits (name kinds preferred).....

Was an orange a treat to you as a child?.....

Were apples plentiful?.....

Vegetables: Tomatoes.....Cabbage.....

Carrots (raw or cooked).....

"Greens".....Lettuce and other salad greens.....

Potatoes (generous).....Meat.....

Cereals: Whole grain, such as Shredded Wheat, Ralston's, Wheatena, etc.....

Milled cereals, such as Cream of Wheat.....

What are your favorite cereals?.....

Bread, white, whole wheat, rye.....

Milk (average daily consumption).....Ice cream.....

Butter.....Cheese (cottage cheese and other cheeses).....

Eggs (number per week).....Fish (kinds).....

Do you drink tea or coffee?.....How often?.....

At what age did you start?.....

Have you made any marked change in your diet?.....

If so, what change?.....

When.....Why.....

Have you ever taken any cod liver oil or preparations containing cod liver oil or preparations from fish oils?.....

If so, when?.....Why.....

Were you an outdoor person as a child and young person?.....

What outdoor activity do you have now?.....

Did you swim a lot as a child?.....

What are your smoking habits? Approximate number of cigarets, etc., per day.....

How much rest do you take?.....

Please submit menus for two weeks, giving the approximate amount of the food eaten at each meal, such as: 1 glass milk, 2 eggs, 2 potatoes, average serving meat, etc. Include all candy, milk shakes, fruit, etc., taken between meals. Mention time of meals, also time of taking extra food.

to be willing to increase their cheese consumption. To add a small piece of cheese to their diets makes less change in their established food habits than the addition of a pint of milk. In other words, it is a wiser plan to build an adequate diet around the foods to which a person is accustomed rather than to attempt to change too many of his dietary habits.

If an 8-ounce glass of milk and about half an ounce of cheese are taken in addition to fruits, vegetables and milk used otherwise in the menus, it is probable that the diet will furnish the 0.7 gm. of calcium, which is the approximate daily requirement of an adult. This amount of milk and cheese, together with meat and eggs, can easily furnish at least the 1.32 gm. of phosphorus needed. If a child takes 3 glasses of milk per day (8 ounces to each glass) besides that used on cereals and in cooking (this should be approximately a quart) and, in addition, moderate amounts of cereals, meat and one egg, the diet should contain the recommended amounts of calcium and phosphorus.

For persons whose milk and cheese

DIET 1

Take daily:

3 (8 ounce) glasses of milk (in addition to milk used on cereals and in cooking).
1 egg.
1 serving of meat, fish, or poultry (or other protein food).
1 medium sized orange, or 1 medium sized tomato, or ½ grapefruit; or 1 cup cold canned tomatoes or tomato juice.
1 serving of lettuce, cole slaw or other vegetable salad; or another serving of fruit (fresh or canned). Dried fruits are also a valuable addition to any diet.
1 serving of cereal (whole grain cereal) not less than three times a week.
2 vegetables or 2 servings of the same vegetable (besides potatoes), such as onions, string beans, peas, carrots, "greens," cauliflower and tomatoes.
Bread, rolls, butter or butter substitutes, and other foods such as pickles, olives, jam, jellies, conserves and desserts to make interesting and appetizing menus.
1 to 2 teaspoonfuls cod liver oil, or other preparations to supply liberal amounts of vitamins A and D.

Sample menu:

Breakfast:	Lunch:	Dinner:
Orange	Scrambled egg	Beef loaf
Cereal, milk	Buttered string beans	Creamed potatoes
2 slices toast, butter	Sliced tomatoes*	Buttered carrots
Glass of milk or cocoa	Bread, butter	Cole slaw
	Canned apricots	Glass of milk
	Glass of milk	Fruit jello, cream
	Cookies	Plain cake

*When tomatoes are expensive, raw shredded carrots or other vegetable can be used. Cold canned tomatoes are appetizing. These and the following menus are only suggestions. Season of year, market conditions, money available for food and also "the way a family likes food served" enter into the planning of menus.

If child takes lunch to school:

Hard boiled egg sandwich, meat sandwich or peanut butter sandwich
Celery
Jar of fruit (canned or stewed) or fresh fruit
Few cookies or plain cake

If hot lunch is served at school, select foods from this.

(This diet is planned primarily for children. As is seen above, family menus may be easily adapted from it.)

DIET 2

Take daily:

2 (8 ounce) glasses of milk (in addition to milk used on cereals and in cooking).
1 egg.
1 serving meat, fish, poultry (or other protein foods).
½ ounce of cheese.
1 medium sized orange, 1 medium sized tomato, or ½ grapefruit, or ½ cup cold canned tomatoes or tomato juice.
1 serving of lettuce or cole slaw or other vegetable salad or another serving of fruit (canned or fresh) (dried fruits are also a valuable addition to any diet).
1 serving of cereal (a whole grain cereal not less than three times a week).
2 vegetables or 2 servings of the same vegetable (besides potatoes), such as string beans, tomatoes, corn, carrots, onions, cauliflower, "greens," turnips, peas and squash.
Bread, rolls, butter or butter substitute and other foods, such as pickles, olives, jams, jellies, conserves and desserts, to make interesting and appetizing menus.
1 to 2 teaspoonfuls of cod liver oil or other preparations to supply liberal amounts of vitamins A and D. (Whether adults need additional vitamin D is, of course, not definitely decided.)

Sample menu:

Breakfast:	Lunch:	Dinner:
½ grapefruit	Cream of tomato soup	Pot roast, gravy
Cereal, milk	Crackers	Browned potatoes
1 egg with bacon	Vegetable plate	Creamed onions
Toast, butter	Bread, butter	Shredded carrot salad
Glass of milk or cocoa	Canned pineapple	Bread, butter, olives
	Cookies, glass of milk	Deep dish apple pie
		Cheese
		Coffee (adults)

DIET 3

Take daily:

1 (8 ounce) glass of milk (in addition to milk used in cooking).
2 eggs (at least 5 times a week).
½ ounce cheese.
1 serving meat, fish or poultry (additional meat, dried peas, or beans, cheese or other protein foods when eggs are omitted).
1 medium sized orange, 1 medium sized tomato, ½ grapefruit or ½ cup cold canned tomatoes, or tomato juice.
2 vegetables or 2 servings of the same vegetables (besides potatoes), such as corn, peas, carrots, "greens," cauliflower, string beans, turnips and onions.
1 serving of cole slaw, or lettuce or other vegetable salad or another serving of fruit (fresh or canned) (dried fruits are also a valuable addition to any diet).
Bread, rolls, butter or butter substitutes and other foods, such as pickles, olives, jams, jellies, conserves and desserts, to make interesting and appetizing menus.
1 to 2 teaspoonfuls cod liver oil or other preparations to supply liberal amounts of vitamins A and D. (Whether adults need additional vitamin D is, of course, not definitely decided.)
Possibly dicalcium phosphate equivalent to the calcium and phosphorus in a pint of milk. (This would depend on the food habits, e.g., how much milk enters into the diet in desserts, creamed vegetables and the like.)

Sample menu:

Breakfast:	Lunch:	Dinner:
Tomato juice	Vegetable soup	Steak, baked potatoes
2 eggs with bacon	Cheese sandwiches	Buttered cauliflower
Toast, butter	Lettuce and tomato salad or other vegetable salad	Stewed tomatoes with onion and green pepper
Coffee, cream, sugar	Canned pineapple, cookies	Mixed vegetable salad or cole slaw
	Glass of milk	Ice cream, cake
		Coffee, cream, sugar

consumption is low and who use only moderate amounts of meat and do not care for eggs and use few foods containing them, and who do not wish to change their food habits, dicalcium phosphate is suggested as the main source of calcium and phosphorus. In these cases, the need for adequate protein is stressed.

The accompanying questions on dietary habits has been found an aid in securing a dietary history from a patient. At the first appointment for the dietary study, the patient is given only this series of questions. He is asked to report back in about two weeks, bringing with him a complete record of the food (the three meals a day as well as extra food) eaten during this time. An hour or more is spent taking a more detailed personal history. Present food habits are discussed; what changes have occurred, and the reasons for them. In the case of children, a conference is held with the mother. A study is then made of these data and they are evaluated and dietary recommendations made.

As will be seen on page —, the dietary factors are evaluated as "excellent," "good," "fair" and "low." These evaluations are arrived at in the following way: If, after studying the patient's present menus and his food habits in the past (as revealed by the series of questions and the personal conference), it is found that milk, cheese and foods utilizing them are and have been used in small amounts at infrequent intervals for years; and if generous amounts of fruits and vegetables (which add some calcium to the diet) have not been used, it is then clear that the calcium intake has not been 0.7 gm. per day for an adult or 1.0 gm. for a child. When an adult's diet is appraised as low in calcium, it has been estimated that, on the average, 0.2 gm. or less has been present daily. Between 0.3

Diet 4

Take daily:

2 eggs (at least 5 times a week).
1 serving of meat, fish or poultry (additional meat, dried beans or peas, cheese, or other protein foods when eggs are omitted).
1 medium sized orange, or 1 medium sized tomato, ½ grapefruit or ½ cup cold canned tomatoes, or tomato juice.
1 serving of lettuce, cole slaw, or other vegetable salad or another serving of fruit (canned or fresh) (dried fruits are also a valuable addition to any diet).
2 vegetables or 2 servings of the same vegetable (besides potatoes), such as string beans, corn, turnips, onions, peas, cauliflower, tomatoes and "greens."
Bread, rolls, butter or butter substitute and other foods, such as pickles, olives, jellies, jams and desserts, to make interesting and appetizing menus.
1 to 2 teaspoonfuls of cod liver oil or other preparations to supply liberal amounts of vitamins A and D. (Whether adults need additional vitamin D is, of course, not definitely decided.)

Possibly dicalcium phosphate equivalent to the calcium and phosphorus in a pint of milk. (This would depend on the food habits, e.g., how much milk enters into the diet in desserts, creamed vegetables and the like.)

Sample menu:

Breakfast:	Lunch:	Dinner:
Banana and cream	Stuffed peppers	Liver and bacon
2 eggs with bacon	Summer squash, buttered	Creamed potatoes
Toast, butter	cauliflower or carrots	String beans, cole slaw
Coffee, cream, sugar	Glass of tomato juice	Hot rolls, butter
	Bread, butter, honey	Lemon pie
	Rice pudding, cream	Coffee, cream, sugar

APPROXIMATE CALORIC VALUES AND APPROXIMATE CALCIUM, PHOSPHORUS AND IRON CONTENT OF BECKS-SIMMONDS DIETS 1-4* (AVERAGE SERVINGS)†

Diet	Food	Wt. Gm.	Prot. Gm.	Fat Gm.	Carb. Gm.	Calories	Calcium Gm.	Phosphorus Gm.	Iron Mg.
1	Milk, 3 (8 ounce) glasses	600	19.8	24.0	30.0	414	0.720	0.558	1.44
	1 egg	50	6.7	5.2	...	74	0.033	0.090	1.26
	Meat	100	19.7	8.0	...	151	0.011	0.212	4.10
	Orange	100	0.9	0.2	10.6	48	0.045	0.021	0.52
	Cereal	100	2.7	1.2	11.1	66	0.011	0.065	1.30
	String beans	100	2.4	0.2	6.3	37	0.046	0.052	0.98
	Carrots	100	1.2	0.3	8.2	40	0.056	0.046	0.64
	Potatoes	100	2.0	0.1	18.7	84	0.014	0.058	0.85
			55.4	39.2	84.9	914	0.936	1.102	11.09
	Bread (4 slices)‡	120	11.6	1.6	61.2	304	0.076	0.117	0.96
	Butter (4 squares)#	40	0.4	34.0	...	308	0.004	0.008	0.08
			67.4	74.8	146.1	1526	1.016	1.227	12.13
2	Milk, 2 (8 ounce) glasses	400	13.2	16.0	20.0	276	0.480	0.372	0.96
	1 egg	50	6.7	5.2	...	74	0.033	0.090	1.26
	Cheese ½ ounce		4.1	5.1	...	63	0.132	0.097	0.19
	Meat	100	19.7	8.0	...	151	0.011	0.212	4.10
	Orange	100	0.9	0.2	10.6	48	0.045	0.021	0.52
	Cereal	100	2.7	1.2	11.1	66	0.011	0.065	1.30
	String beans	100	2.4	0.2	6.3	37	0.046	0.052	0.98
	Carrots	100	1.2	0.3	8.2	40	0.056	0.046	0.64
	Potatoes	100	2.0	0.1	18.7	84	0.014	0.058	0.85
			52.9	36.3	74.9	839	0.828	1.013	10.80
	Bread (4 slices)	120	11.6	1.6	61.2	304	0.076	0.117	0.96
	Butter (4 squares)	40	0.4	34.0	...	308	0.004	0.008	0.08
			64.9	71.9	136.1	1451	0.908	1.138	11.84
3	Milk, 1 (8 ounce) glass	200	6.6	8.0	10.0	138	0.240	0.186	0.48
	Cheese, ½ ounce		4.1	5.1	...	63	0.132	0.097	0.19
	2 eggs	100	13.4	10.5	...	148	0.067	0.180	2.52
	Meat	100	19.7	8.0	...	151	0.011	0.212	4.10
	Orange	100	0.9	0.2	10.6	48	0.045	0.021	0.52
	String beans	100	2.4	0.2	6.3	37	0.046	0.052	0.98
	Carrots	100	1.2	0.3	8.2	40	0.056	0.046	0.64
	Potatoes	100	2.0	0.1	18.7	84	0.014	0.058	0.85
			50.3	32.4	53.8	709	0.611	0.852	10.28
	Bread (4 slices)	120	11.6	1.6	61.2	304	0.076	0.117	0.96
	Butter (4 squares)	40	0.4	34.0	...	308	0.004	0.008	0.08
			62.3	68.0	115.0	1321	0.691	0.977	11.32
4	2 eggs	100	13.4	10.5	...	148	0.067	0.180	2.52
	Meat	100	19.7	8.0	...	151	0.011	0.212	4.10
	Orange	100	0.9	0.2	10.6	48	0.045	0.021	0.52
	String beans	100	2.4	0.2	6.3	37	0.046	0.052	0.98

(Continued on next page)

Carrots	100	1.2	0.3	8.2	40	0.056	0.046	0.64
Potatoes	100	2.0	0.1	18.7	84	0.014	0.058	0.85
		39.6	19.3	43.8	508	0.239	0.569	9.61
Bread (4 slices)	120	11.6	1.6	61.2	304	0.076	0.117	0.96
Butter (4 squares)	40	0.4	34.0	...	308	0.004	0.008	0.08
		51.6	54.9	105.0	1120	0.319	0.694	10.65
If 1 ounce cheese is added		8.2	10.2	...	126	0.264	0.194	0.38
		59.8	65.1	105.0	1246	0.583	0.888	11.03

*Gravy, salads, desserts and "extra foods" not included.
†Taken from "Nutritive Value of Foods," by D. S. Waller. (See diet sheets for details.)
‡White bread, made with milk.
#One square 1¼ inch by 1¼ inch by ¼ inch.

and 0.4 gm. would be evaluated as "fair" and about 0.4 to 0.5 gm. as "good"; whereas, if 0.7 or more is taken, the diet is appraised as excellent. In the case of a child, below 0.4 would be rated low; 0.6, fair; 0.8 good, and 1.0 or more, excellent. In the same general way, phosphorus is evaluated. The vitamin foods are estimated in the light of the foods taken which contain them. In the case of vitamin D, outdoor habits must also be taken into consideration.

It is fully recognized that any dietary appraisal, except with carefully weighed diets, is only a by and large average; but when the dietary properties of foods are known, this average, it is believed, is sufficiently accurate for routine dietary studies.

Patient H.D.B., aged 32. (Any estimate of a dietary history without an accurate record of food consumption is only a by and large average. But when the food interests, food habits and mode of living are known, we believe that a fair estimate can, as a rule, be formulated.)

Calcium: Excellent up to 12 years of age; undoubtedly good up to 21; low (very) from age 21 to 25; good from then to present time.

Phosphorus: Excellent up to 12 years of age; undoubtedly good or even excellent from then to present time.

Vitamin A: Excellent during entire history.

Vitamin B: Fair to good during entire history.

Vitamin C: Good to excellent up to age 21; low to fair from age 21 to 25; good to excellent from then to present time.

Vitamin D: Excellent up to 12 years of age; probably good from this time until about 29; excellent since then.

Vitamin G: Good during entire history.

Patient K.L., aged 12.

Calcium: Fair to good.

Phosphorus: Fair to good.

Vitamin A: Fair.

Vitamin B: Low to fair.

Vitamin C: Fair to good.

Vitamin D: Low, except from age of 2½ to about 8, when living in section of city where there was an abundance of sunshine and out of door life much of the time (probably good during this time). Difficult to estimate because of question of clothing and time spent out of doors. Child not given cod liver oil or other preparation containing vitamin D and butter and egg consumption was not generous.

Vitamin G: Good.

This child comes from parents who can afford plenty of food, but the impression gained from a conference with the mother together with the menus submitted was that the mother had not informed herself about the dietary needs of children.

On the basis of nearly 200 dietary

studies, definite types of diets for different groups of persons have been formulated and have been called Diets 1-4. (If a person needs a special diet for nephritis, diabetes or other condition requiring dietary regulation, the case is handled by a physician. Diets 1-4 are planned only for persons who are taking a general diet. The difference in the diets is merely a substitution of one food for another so as to adjust the diet to the individual's established food habits. If, in the use of Diets 3 and 4, dicalcium phosphate or other calcium salt seems to be indicated, this should be prescribed only by a physician. Except in unusual cases, all dietary essentials, except possibly vitamin D, can be furnished by foods.) From menus submitted and the results of conference, the personal tastes of the individual are determined and an adequate diet is adapted to his likes and dislikes, without any abrupt changes in his established habits.

Diets 1 and 2 contain adequate amounts of all the minerals and vitamins as well as other dietary essentials. If a patient's food habits are such that Diet 3 or 4 is suggested, further instruction is given because, as the diets now stand, it is evident that they are not optimum in all factors. Details as to methods of adjusting the several diets for patients would require too much space for this paper. That intangible something known as the "personal equation" has to be taken into consideration in discussing one's food habits. Tact and diplomacy are needed in making dietary studies, just as in other dental and medical problems. It will be noted that in each of the diets, considerable choice is left to the individual; an important feature in this work.

When one does not care for whole grain cereals, an excellent source of vitamin B, he is urged to secure more of this factor in any of several other ways. It is important to have a generous supply of this substance in the diet.

The diets as planned cannot be called inexpensive, but the cost has been kept as low as possible to be compatible with good food habits. There are numerous ways in which adjustments can be made to suit the individual.

The table on page 1735 gives the approximate calories and approximate calcium, phosphorus and iron in Diets 1-4. The caloric and mineral values are given for only part of the diet. Four slices of bread and 4 squares of butter are used for calculation. It should be emphasized that these calculations are in no sense to be considered a "weighed calculated diet." They are only a general estimate of the outline given under Diets 1-4.

It should be emphasized that as yet it is not known whether these are "caries preventive diets." If nutrition is of importance for the health of the teeth and paradentium, the diets outlined may be considered adequate. It is hoped that they will prevent caries, as well as other dental diseases, where only a nutritional factor is at fault. They contain (in the case of Diets 3 and 4, are adjusted to contain) generous amounts of all factors, and if they are faithfully followed and good oral hygiene is practiced, the incidence of caries and disorders of the paradental tissue in individuals free from metabolic disturbances should be markedly reduced.

It is fully recognized that it is often a difficult matter to keep a person on a prescribed diet outside of a hospital or an institution, but when it entails no unusual dietary procedure, fair cooperation may be counted on.

As a result of the dietary studies which form the basis of this discussion, the question may be raised as to whether what is usually termed "the average diet" (especially after the age of from

10 to 12 years, and at times even before this) is really nutritionally complete. As a rule, it has been found that the calcium and phosphorus are considerably below the amount recommended as adequate. In but few cases could it be said that all the vitamins were present in generous amounts, and in not a few instances the protein was obviously below the amount usually recommended. It is true, of course, that clinical manifestations of deficiency diseases are not in evidence. The pertinent question thus arises: Are tooth decay and paradentosis in many instances the first and sometimes the only symptoms of such deficiencies? This interesting and important question is the subject of detailed investigation.

IMPORTANCE OF GOLD FOIL TO THE GENERAL PRACTITIONER

By EARL D. HARRISON, D.D.S., Oakland, Calif.

NO doubt you are expecting me to give a detailed description of the technic for making a gold foil restoration; or to make an attack on the gold inlay and to extol the virtues of gold foil. It is not my purpose to do either of these things.

Excellent articles on the technic of all classes of gold foil restorations have been written and are easily available. Gold foil *versus* the gold inlay has been discussed at great length. Why there should be a *versus* in the matter is beyond comprehension.

Leaving this part of the question to others, I shall point out the place that gold foil should occupy in the mind and practice of every dentist.

What man among us has not, in the day after day grind of dental practice, been tempted to adopt shortcuts and to slight certain fundamentals in cavity preparation if the nature of the restoring material will permit?

Gold foil is the one restoring material which will not permit of these deviations. Consequently, the cavity preparation for it may well be used as a measuring stick, or standard, by which we may compare our preparations for use of other materials.

Much inlay cavity preparation is made with mounted stones; which is undoubtedly within the scope of good practice; but there are certain tendencies which must be guarded against, and it is well to have a clear conception of the ideal if these tendencies are to be checked.

The cutting of concave gingival walls in proximal cavities, these walls merging into the buccal and lingual walls as the arc of a circle, is not a good practice. It means that the buccogingival and linguogingival margins are not extended sufficiently far for safety, or, if they are, the gingival wall is extended dangerously far rootwise. The straight gingival wall is of prime importance.

One of the fundamentals taught to dental students is the conservation of tooth tissue. It is far easier, with a stone, to make broad extensions till all undercuts are removed, than it is to eliminate undercuts by use of cement. But how justify the sacrifice of tooth tissue, for the saving of a few moments' time, when

the conservation and preservation of this tissue is our prime duty?

I have read items in dental magazines advocating leaving decay in a cavity, until the pattern has been prepared, if removal would create an undercut. From this, it is but a short step to leaving the decay in the cavity till after the inlay has been set. This is a dangerous shortcut and a deviation that the gold foil cavity or standard would not permit.

If the cavity preparation is entirely completed before the beginning of pattern or impression making, there cannot conceivably be a possibility of a moment's forgetfulness defeating the purpose of the whole operation.

If stones and other engine instruments are used to extreme, the skill required in using hand instruments will be impaired or lost. There are steps in cavity preparation wherein skill in the use of hand instruments is essential, if we are to approach the standard of perfection set by the gold foil cavity.

No one should doubt the advisability, the necessity, of a gingival cavosurface bevel, but this must in nearly all cases be made with hand instruments. Yet I have talked to men who do not even possess the gingival margin trimmers necessary to the preparation of this bevel.

In preparing a cavity for silver amalgam or a gold inlay, if the picture of the properly prepared foil cavity is kept in the mind's eye and the ability to prepare it developed and maintained in the fingers, better amalgam and inlay restorations cannot but result. No restoration can be better than the cavity preparation.

A number of articles have appeared in dental journals during the last few years, describing the perfection of inlays placed by operators in various parts of the country. Perhaps these men *have* developed their skill nearly to perfection. Yet, any one of us has only to think back over his experience and recall some of the miserable examples encountered in examining mouths, to make him wonder if all these descriptions are based on actual performance. Defective and leaky margins, especially at the gingival aspect, have been all too common.

The answer is not to be found entirely in new casting technics to overcome shrinkage. There is another big factor that cannot be overlooked; and that factor is cavity preparation. Even in the early days of the gold inlay, excellent examples were produced, but the fundamental basis for the success of these restorations was proper cavity preparation.

Recently, I found it necessary to remove two inlays, in different mouths, that had been placed in 1913, over twenty years ago. They were removed, not because they had failed, but for preparation of bridge abutments, and both of these inlays were made by a man who has for many years been a skilful and enthusiastic gold foil advocate. The cavity preparation under these inlays bore the trademark of a man whose conception of cavity preparation was well founded. And the twenty years' service rendered by the restorations bore testimony of his knowledge of cavity preparation and his ability to perform with his hands what his mind had conceived.

Albert P. Grunn,[1] of Chicago, made this statement: "When the gold inlay was introduced, I made up my mind to build a better gold inlay than a foil or not do inlay work at all." There is the keynote to the whole situation. Dr. Grunn began with cavity preparation. His knowledge of this was based on association with and study under G. V. Black and Charles P. Pruyn, both skilful gold foil operators.

Undoubtedly, with his training and ex-

1. Grunn, Albert P.: Gold Foil Vs. Gold Inlay, J.A.D.A., 18:1015 (June) 1931.

perience, nothing but the best would satisfy him. For excellent inlays *can* be made; but *are* they being made?

When you criticize the work of another operator, to a patient, you are hurting yourself most of all. With this in mind, how many times have you explained that, unfortunately, the decay starting elsewhere on a tooth has undermined an inlay to such an extent that it must be removed; when you know that faulty margins have been responsible for the whole situation? Here, we are again back on the subject of properly conceived and executed cavity preparation.

If the men whom I have mentioned could make excellent inlays twenty years ago, what is our excuse if we cannot equal their skill in these days of better casting golds, investments and technics? Our only excuse is that their knowledge and skill in cavity preparation excelled ours. Their skill was based on the gold foil cavity. So, I maintain, every step indicated for improvement in gold inlay work points to the need for greater skill and knowledge of correct procedure for gold foil work.

I wish now to touch on another necessary adjunct to gold foil work, the rubber dam. If the gold inlay, the amalgam and the silicious cement restoration were far superior to the gold foil, I would still deplore the fact that gold foil had fallen so much into disuse, because it is the only type of restoration that absolutely demands the use of the dam.

When Dr. Barnum introduced the rubber dam in 1864, he made one of the greatest contributions to dentistry that has ever been made. This has been thrown into the discard by far too many dentists, on excuses that are not valid. One is that the patient will not submit to its use; another, that its application requires too much time. To an operator accustomed to the use of the dam, both excuses are weak. A few seconds' explanation to the patient, while the dam is being prepared, as to its advantages, is all that is necessary. The advantages of a dry, sterile cavity and field of operation and increased visibility, with the resulting possibility of finer cavity preparation and, hence, more lasting work, will appeal to practically all patients. I doubt that any operator ever lost a patient through insisting on the use of a rubber dam.

The patient will permit the dam to be used, and if it is applied skilfully, the time saved in cavity preparation will more than offset the two or three minutes required to place it. The constant and repeated expectoration, the washing out and drying of the cavity to see where to cut next, involves a far greater loss of time. After the first application of a dam, over a Woodbury dam napkin, which keeps the rubber from contact with the face and lips, a great many patients prefer it to the wet fingers of the dentist and the drooling of saliva over the lips when the dam and napkin are not used.

There will be no loss of time if a dam is placed for the preparation of the cavity and again for the setting of an inlay; and the disconcerting experience of having a "Niagara" of saliva invade the cavity, just as the cement is ready to be placed in it, will be avoided. The knowledge that you have ample time in which to make a proper mix of cement is, in itself, justification for the use of the dam at this stage of inlay work. Imperfect as are cements, they are deserving of full mixing time, at proper temperature, to get the best possible results.

Silicious cement restorations are unquestionably as temperamental as prima donnas are reputed to be. Granting that they leave much to be desired at the very best, if we are to use them at all, we should give our patients the advantage of

making them as lasting and as nearly perfect as possible.

When we consider that practically all of this material is used in cavities of classes III and V, we realize that there is always one margin at or under the gum line. It is practically impossible to keep this margin free from moisture for fifteen minutes. Yet, this is what must be done, if the best results, which are poor enough, are to be obtained. The rubber dam offers the solution to this problem, and in no case should this material be placed without its aid.

There are certain places in the mouth where no other restoring material is so practical or so satisfactory as gold foil, from the standpoint of conservation of tooth tissue, time or durability.

First, let us consider the proximal cavities in anterior teeth. The gold inlay requires too great a destruction of tooth tissue. The porcelain inlay is treacherous as to shade and fit, apparently, and it requires rather extensive cutting. Here, the cry that patients will not permit the use of gold in anterior teeth is heard. That is true in some cases, but not in nearly so many as we lead ourselves to believe. The trouble is that not enough attempt is made to convince the patient that gold foil should be used, if the teeth are valued. There is a temptation to take the easy way out and agree that the "porcelain" restoration looks better and will last pretty well. If an explanation is made that this is *not* porcelain, a name that conjures up a picture of a material somewhat like china, with its durability, but is merely a silicious cement that can be regarded as only a temporary expedient and must be renewed periodically. each renewal driving another nail into the coffin of the tooth, the opposition to gold foil will be much lessened.

In the gingival cavities, an operator of reasonable skill can prepare and place a gold foil filling in less time than is required for the inlay, and it is all finished at one sitting. There is much less tooth destruction, for the cavity can be made less deep than that required for an inlay. The foil with its smooth finished margins will stay in place, while far too many inlays in this area fall out.

In small Class I cavities, again, foil may be placed in less time and with far greater conservation of tooth tissue, and certainly silver amalgam is not so desirable in the occlusal surfaces of upper bicuspids and first molars, even though it is often resorted to.

Finally, in answer to the possible question as to where proper training in gold foil work can be obtained, let me say that the gold foil study club fills a much needed place in this field. Let me quote from an article written by George N. Hollenbeck, of Los Angeles[2]:

> It would seem evident that those clubs which have devoted their efforts almost exclusively to the problems of operative dentistry, and more particularly to gold foil, have been longer lived and perhaps have more to their credit in the way of improvement of the knowledge and technical skill of their members than have clubs devoted to other phases of dental practice. It seems that the perfection of an operator in gold foil technic not only gives him the knowledge whereby other phases of operative dentistry can be more successfully handled but also much better fits him to cope successfully with the many problems constantly arising in dental practice outside of the operative field. . . .
>
> A very large percentage of the men who, in the past, have made dental history and those who are making it today have been and are skilled foil operators. There are few, if any, radicals in their ranks. In fact, they perhaps constitute the most safe, sane and conservative group in the profession.

2. Hollenbeck, G. N.: Gold Foil Study Club, J.A.D.A., 20:1606 (Sept.) 1933.

This is real tribute from a man who is a deep thinker, a skilful operator and himself a maker of dental history.

And so my plea is not that we all adopt gold foil and discard all other restoring materials, but rather that we reacquire or perfect the ability to use gold foil, that we may keep in our minds the picture of the highest type of operative work and in our fingers the ability to execute it, that we may give to humanity that to which it is entitled: the best that is possible.

Medical Building.

CERTIFIED IMPRESSION COMPOUNDS A.D.A. SPECIFICATION NO. 3*

SAMPLES of all impression compounds certified to the Research Commission of the American Dental Association by the various manufacturers were purchased in the open market by the Research Commission and tested by the A.D.A. Research Associates at the National Bureau of Standards. As of Aug. 1, 1935, the following list of compounds was found to comply with American Dental Association Specification. Compounds which did not comply are omitted from this list.

THIRD SURVEY OF IMPRESSION COMPOUNDS
Aug. 1, 1935

Compound	Manufacturer or Distributor
Brewster	E. R. S. Brewster
Dresch	The Ransom & Randolph Co.
Kerr Black	Detroit Dental Mfg. Co.
Kerr No. 3	Detroit Dental Mfg. Co.
Kerr Perfection	Detroit Dental Mfg. Co.
Kerr White	Detroit Dental Mfg. Co.
Moyer	The J. Bird Moyer Co.

*Report from the Research Commission of the A.D.A.

*Taylor, N. O.; Sweeney, W. T., and Paffenbarger, G. C.: Specification for Dental Compound, J.A.D.A., 18:60 (Jan.) 1931.

RESPONSIBILITY OF THE CLINICIAN IN TRACING THE TRANSMISSION OF SYPHILIS

By MALCOLM WALLACE CARR, D.D.S., F.A.C.D., New York City

IT has been observed that in its clinical manifestations, syphilis may simulate other diseases. There are certain lesions of syphilis that are pathognomonic. Oral lesions of the primary, secondary and tertiary stages of syphilis have been frequently demonstrated and have been well described in textbooks and in periodical literature. Intra-oral manifestations of congenital syphilis also are not uncommon.

Guszman[1] recently described his observations on the teeth of 116 adults with congenital syphilis. He points out that there are a number of anomalies of the teeth the presence of which is considered suggestive of or characteristic of congenital syphilis. He mentions particularly the following: (1) late second dentition, (2) microdontism, (3) absence of certain groups of teeth, particularly of the maxillary lateral incisors, (4) dystrophic crowns with hypoplasia of enamel, (5) atrophy of the occlusal surfaces, particularly of the first molars, (6) abnormal position of the teeth, (7) "amorphic" teeth (so-called fish-teeth) and (8) Hutchinson's teeth. He considers Hutchinson's teeth the most important of the dental anomalies of congenital syphilis, but admits that they are not frequent. He observed them in 12 per cent of his patients with congenital syphilis and asserts that typical Hutchinson's teeth are found only in persons with congenital syphilis. He states also that, with the exception of Hutchinson's teeth, the anomalies are not a sufficient basis for a clinical diagnosis of congenital syphilis, but they should be an inducement to further search for other symptoms, and, in this manner, they may lead to the discovery of the otherwise entirely latent congenital syphilis.

In addition to the intra-oral manifestations of congenital syphilis described by Guszman and commonly referred to in literature, congenital syphilitic osteomyelitis of the mandible is not uncommon. Ivy and Curtis[2] recently published a report of two analogous cases in sisters. Two cases of congenital syphilis with osteomyelitis of the mandible have been seen in the oral surgical service of the Fifth Avenue Hospital, New York City. Both patients were boys, one, 4 years of age, with necrosis and osteomyelitis of the lower border of the mandible, the other, 7 years of age, with necrosis and osteomyelitis of the condyloid process. Both patients had positive Wassermann reactions (4+) and both improved under antisyphilitic treatment.

It is evident, therefore, that the clinician will, during the course of routine practice, see intra-oral manifestations of acquired or congenital syphilis. It is apparent also that the clinician is respon-

1. Guszman, J.: Changes in Teeth of Patients with Congenital Syphilis, Arch. f. Derm. u. Syph., 170:572 (Nov.) 1934.

2. Ivy, R. H., and Curtis, Lawrence: Congenital Syphilitic Osteomyelitis of Mandible, Ann. Surg., 100:535 (Sept.) 1934.

sible for the recognition of these lesions. This responsibility becomes evident when it is considered that the intra-oral manifestations of acquired syphilis may antedate the general constitutional symptoms and that early diagnosis permits early treatment. Furthermore, patients with intra-oral manifestations of acquired or congenital syphilis may be entirely unaware of the fact that they have contracted the disease, and consequently have never received treatment. The clinician trained in oral pathology is therefore capable of rendering a most important phase of health service in recognizing the intra-oral lesions of syphilis, and referring the patient for appropriate constitutional treatment, if the diagnosis has been confirmed by serologic examination. Many patients will thus have the benefit of early treatment and the possibility of arresting the disease before the onset of the serious quaternary stage, in which the central nervous system becomes involved, and terminating in tabes dorsalis and general paresis, will be greater.

Smith and Brumfield[3] recently emphasized the importance of tracing the transmission of syphilis and presented a new method for the control of this disease. They write: "All of the facts necessary for an effective epidemiologic attack against syphilis are known. Several lines of approach to the problem are frequently mentioned. These are education (lay and professional), medical prophylaxis, isolation of infectious cases, modern treatment, determination of sources of infections and follow-up of contacts." It is a routine procedure to give consideration to the source of any communicable disease, yet determination of the sources of syphilitic infection and follow-up of contacts have not received, either abroad or in this country, the emphasis they merit. Smith and Brumfield[3] point out that tracing the transmission of syphilis has seemed to be an insurmountable hazard, but it is actually attended only by a mental handicap. The investigation requires a considerable amount of patience, ingenuity and tact, but the conscientious efforts of the skilful and persuasive clinician will be rewarded by the same gratifying results obtained by Smith and Brumfield. They conclude: "It is practical to trace sources of infection and exposure in syphilis. By these measures a larger proportion of cases are brought under observation, and the period of infectiousness is reduced and the secondarily infected ratio thereby decreased."

Syphilitic warts of tongue in child, aged 11, with congenital syphilis.

The case report that follows is interesting from a standpoint of clinical pathology, but is of significance because it presents a practical demonstration of the value of tracing the transmission of syphilis.

REPORT OF CASE

G. N., a girl, aged 11 years, first seen in the out-patient dispensary, complained of "sore tongue" of six weeks' duration. She had received local treatment, the nature of which could not be determined, at another dispensary. Examination revealed a number of small nodular, papillomatous,

3. Smith, D. C., and Brumfield, W. A.: Tracing Transmission of Syphilis, J.A.M.A., 101:1955 (Dec. 16) 1933.

warty growths on the under surface of the tongue at the anterior tip and extending posteriorly along the border of the tongue on the right and left sides as far back as the middle third, as shown in the accompanying photograph. The lesions did not appear inflamed nor to be of the type that develop from chronic irritation. They were not ulcerated, but appeared as small cauliflower masses with moderate hornification. The maxillary central incisors presented the typical characteristics of Hutchinson's teeth, with notched incisal edges and globular shaped crowns. Dentition was otherwise normal. The child was well nourished and normally developed. Complete physical examination revealed no other abnormalities of growth or function. The appearance of the maxillary central incisor teeth suggested congenital syphilis, which was confirmed by serologic examination. The Wassermann reaction was 4+. The tongue lesions in this case were characteristic of "syphilitic warts," which result from hypertrophy of the papillae with thickening of the epithelial layers and are found in various mucous membrane surfaces. The patient was given intravenous injections of neoarsphenamine (0.3 gm.) twice each week. Four weeks after treatment was started, the lesions had entirely disappeared.

It is desirable in congenital syphilis to trace the origin of the contagion. Accordingly, investigation was pursued in order to procure a complete family history. The family in this instance consisted of the father, the mother and one sister, aged 7 years, all of whom were examined subsequently.

The history of the father revealed that he had had gonorrhea fifteen years ago. Twelve years ago, he sustained a fracture of the humerus, followed by infection (osteomyelitis?) requiring incision and drainage. There was apparently delayed union of the fracture. Seven years ago, he stated that he "had six injections of 914." He gave no history of a primary lesion. The Wassermann and Kahn reactions were negative.

The mother gave no history of serious illness in childhood or in later years. Fifteen years ago, she had twelve injections "to help her put on weight." Twelve years ago (one year before her older child was born), she had a miscarriage. The Wassermann reaction was 4+. She gave no history of a primary lesion. Appropriate treatment was instituted.

The younger child was only moderately well developed and nourished. Her appetite was poor. The dentition was retarded, with delayed eruption of the maxillary incisors. The mandibular central incisors presented typical hutchinsonian characteristics. Physical examination was otherwise negative. The clinical diagnosis of congenital syphilis was confirmed by positive serologic tests. Appropriate treatment was instituted.

CONCLUSION

Careful clinical investigation and tracing of the origin of contagion in congenital syphilis, with follow-up of contacts in acquired syphilis, are a responsibility that must be accepted by everyone engaged in health service.

The Journal of the American Dental Association

212 East Superior St., Chicago, Ill.

C. N. JOHNSON, Editor

NEWTON G. THOMAS, Associate Editor

Published by the American Dental Association

All expressions of opinions and all statements of supposed facts are published on the authority of the writers over whose signature they appear, and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association.

Communications intended for publication in the scientific or literary pages of THE JOURNAL should be addressed to the Editor. All advertising or business matter should be sent to the Business Manager.

Subscription is included in the annual membership dues. The subscription rate to non-members is $5.00 a year in advance, this rate applying to both domestic and foreign subscribers. All foreign subscriptions are to be paid in United States money.

Editorials

THE COMING NEW ORLEANS MEETING

What promises to be one of the best meetings the American Dental Association has ever held will convene in New Orleans, Nov. 4-8, 1935. The lengthened year since the 1934 meeting in St. Paul, to bring the date of the coming meeting to a time when the weather in New Orleans was sure to be propitious, has given ample opportunity for the most effective preparation.

The officers of the Association, the officers of the Sections, the chairmen of the various commissions and committees, have all gone at their work in a very commendable manner, and the result is a setting for the meeting that must command the attention of every one of our members and make them want to go to New Orleans in November.

For the ethical members of the profession who are not yet affiliated with our Association, this meeting should prove a loadstone to attract them to apply for membership in time to enjoy the privileges of such a meeting. There is another group that might conceivably and justifiably wish to attend such a meeting, and that is the group

represented by the men who, in the recent economic stress, have felt it necessary to drop out and permit their dues to go by default. The officers of the various components, as well as the officers of the parent body, are disposed to be very lenient in the way of reinstatement for such men, and every encouragement is given them to qualify and come back into the fold. It is confidently believed that with the economic improvement going on, many of these men will wish to seek reinstatement and attend the meeting. The increase in our membership during the past year is substantial evidence of an awakening sentiment in favor of our Association, and this must inevitably be reflected in a large attendance at New Orleans.

The members of the Local Committee on Arrangements have worked faithfully and energetically through a long and somewhat trying summer when doubtless they would have preferred taking a vacation in the mountains or by the seaside, and we are assured by them that the stage is set for a smooth running and workable meeting. It is seldom that the rank and file of the membership ever realize the volume of work performed by the Local Committee, or the thought and energy that go into the preparation for each succeeding meeting. To get ready for such a meeting is not merely a matter of days or weeks or months: it is a task demanding a whole year's constant effort, and in this particular case, the year has been a good bit longer than the proverbial twelve months. A debt of gratitude is due these men for their untiring and prolonged effort on behalf of the Association and the profession.

The program for this meeting promises to be exceptionally good. For the General Meetings, there are speakers of renown to address the assemblage, dealing with the broader issues of the profession as comports with the policies and problems of dentistry in its more comprehensive aspects.

The Section Officers have prepared programs of unusual interest for the special departments committed to their care, and no matter in what sphere of activity the member may be interested, he will find ample entertainment and enlightenment. After all, the main incentive of the meeting is the character of the program both literary and clinical, and this leads up to a prominent feature of the meeting, the clinics. These will be of the most diverse character,

and in numbers they will embody every known kind of operation performed by the profession. Be sure to attend the clinics.

In the coming meeting place, there are many attractions. The charm of New Orleans has been heralded from the earliest days when the stamp of old France was impressed on the place, and when later the fascinations of Creole life, softened and mellowed by the genius of Cable, brought to the readers of the world the vision of a life almost wholly different from anything else on the continent or in fact from anything else in the world. There were phases of that life that were more fanciful, more alluring, more colorful and, in many ways, more delightful than anything that we have ever seen or that we see in existence at the present time, yet the memories of those allurements are brought vividly back to us as we roam the old streets of New Orleans today and lend ourselves to the moods and mysteries of those never-to-be-forgotten days. When we think of New Orleans, we unerringly think of adventure, of romance and of love. In all of these attributes, the place holds for us a rare fascination, an aura of all that is attractive and beautiful. We think of life not as it is in the counting room or the market place, but on the balconies in subdued twilight, accompanied with soft laughter and the tinkling of guitar and mandolin. Life not in the sordid sense of barter and trade, but life where the coin of the realm is measured in hearts of women and of men, and where the affections hold sway, and the grinding toil of penury has little or no meaning.

A visit to New Orleans under any circumstance is worth the effort, but it is doubly so in connection with such a meeting as that of the American Dental Association, where, in addition to the attractions of the place, there is ample recompense in the scientific treat that is spread out for every member to enjoy.

Even if a member has taken his customary vacation this summer, a break of a week in November to go to New Orleans will be beneficial. What he gains in recreation and in scientific knowledge will amply repay him many fold for the sacrifice he makes; and the tedium of the coming winter will be immeasurably relieved thereby both physically and mentally.

Visit New Orleans in November. The feast is spread—come and enjoy it!

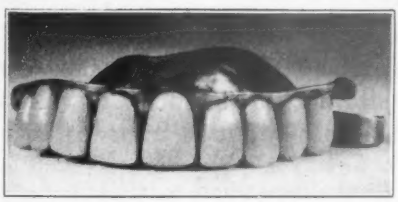
AN INTERESTING RELIC

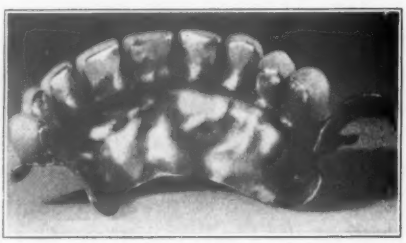
Through the kindness of Dr. H. D. Chipps, of Corinth, Miss., we are permitted to present the illustration of a very interesting relic of the Civil War. It is a partial upper denture of swaged gold plate with single teeth soldered on, and clasps on the molars for retention, which was recently found on the battlefield of Corinth. As will be seen, one of the clasps has been broken off, whether while the soldier was wearing the denture or subsequently, it is impossible to tell.

The denture was undoubtedly lost by a fallen soldier in the heat of battle, and had remained undiscovered for seventy-three years.

We cannot do better than quote Dr. Chipps:

As you know, the battle of Corinth was a terrific struggle lasting two days, Oct. 3-4, 1862, with nearly 100,000 men engaged and with the following losses: Union (Gen. Rosecrans, Com'd'g)—Gens. Hackleman and Kirby Smith, 315 killed, 1,812





wounded and 232 missing. Confederate (Gen. Van Dorn, Com'd'g)—Col. Rogers, 1,424 killed, 5,000 wounded and 2,268 prisoners.

This relic gives rise to considerable conjecture as to the probable artisan, who was no doubt one of the renowned dentists of his time. Unlike Hamlet soliloquizing over the skull of Yorick, we are unable to describe the individual who wore the restoration, but it is interesting to try to see in our mind's eye the characters involved.

From the evidence of worn facets, it is reasonable to assume that the denture had given service for a number of years, having probably been made in the 1840's or early '50's, and your profound knowledge of dental history may enable you to accurately place the craftsman among the few skilled dentists of that time, as the paintings of an old master are identified by his brush strokes.

No, my dear Doctor, we are unable to identify the craftsman. This was the kind of denture most in vogue in those days among the better element of the profession, and there is no known means of identification. Even as early as 1840, it is estimated that there

were approximately 1,200 dentists in the United States, many of whom were presumably capable of constructing this kind of denture.

In another connection, what may interest Dr. Chipps as well as other members of the profession is an upper denture that fell into the Editor's hands a few days after the receipt of the battlefield relic.

It was an upper continuous gum denture made by the late Dr. L. P. Haskell, of Chicago. When a woman patient brought this denture to the Editor with the request that he repair a broken cuspid, he took the piece in his hands with much reflection and a great deal of reverence. He knew Dr. Haskell so intimately, and was so familiar with his well known partiality for continuous gum dentures that, when he looked at this denture, he was filled with considerable emotion, and a great deal of veneration for the genius of the man who made it. The denture has been worn for fifty-two years and is still doing service.

Might there not be something in this to justify the assertion that dental service well performed is immeasurably worth while? Could this patient ever have received a similar benefit from any like sum that she had ever expended? Should not this incident, as well as numerous others of a similar nature that might be recorded, tend to increase the respect that dentists have for their work, as well as impress the patient with the fact that dental service well performed is in every way worthy of a just remuneration?

ACCEPTED DENTAL REMEDIES 1935

It will be recalled that the book "Accepted Dental Remedies" was issued by the Council on Dental Therapeutics in answer to a demand for an authoritative and handy volume low in cost and of undoubted value to the members of the profession. It was a modest venture and the idea was that if an edition of fifteen hundred copies were called for, the undertaking would be accounted a success. To the astonishment of every one, the sales ran up to approximately six thousand copies.

It early became evident that a new edition would soon be called for and work was accordingly begun on a revised copy. The second edition is now ready after a most thorough revision, and the addition of much new material. Even with the added cost of the new volume, the price has been kept down to the original sum of one dollar per copy.

It is doubtful that anywhere in dental literature a similar value was ever offered to the profession, and we predict a rapid and increasing sale of the new work.

One of the agencies that contributed to the extensive sale of the first edition was the hearty support of the deans of our dental schools. Without that, the book would have been obliged to win its way through the slow process of individual endorsement, but when the deans required or recommended the book in nearly every one of our dental schools, an impetus was at once lent to the sales, with very satisfactory results.

Now that the first edition has been so cordially received, and the book has been so generally approved, we may confidently look forward to a wide distribution of the second edition. Advance orders already indicate that the demand will exceed that for the first edition.

A new feature of the book, still in the experimental stage, is a section giving suggestions on prescribing and formulas based on the material in the body of the book. This will not only be greatly appreciated by the dentists, but it will also make an appeal to pharmacists, and lead to the intelligent prescribing of remedies instead of the handing out of a slip from a commercial house with the name of some proprietary product printed on it.

The publication of this book should make such an appeal to the ethical nonmember of the Association that when his attention is called to it, he will naturally want to establish membership in a body that fosters enterprises of this character. It will go a long way toward establishing sanity in the administration of dental remedies and tend to clarify a situation in which there has been much confusion.

RETHINKING THE WAY

Every man is at times confronted by the need of changing his philosophical stance, of making new adjustments, of adapting himself to upspringing emergencies. New concepts issue from life's chaos to be analyzed, measured, tested. Often, the first response is resentment, refusal, flat denial. But these concepts demand attention. They seem to take charge of life, they force their issues irresistibly. To stand objectingly for the old, to belligerently oppose the new, may be accredited as strength, but not always as wisdom.

The past twenty-five years have presented many such experiences. Methods and applications that have been regarded as immutable have dissolved in the fierce heat of change. The good enough, the satisfactory of yesterday, is found inadequate for today. And the days move so rapidly that many men are bewildered; they make a defense of fundamentalism. They miss the point that life is the most flexible, the most adaptable, the most variable element in the universe and that the greater the number of lives involved, the more complex the problem. Such men are to be both pitied and blamed. They have failed in the art of rethinking, of applying the few principles of living to the multiplying conditions of life.

Professions are like the men who compose them. To live, to serve, to continue effective, men must be adaptable, variable. They must be forever rethinking their way. The old applications and methods become ineffective and futile. To exist, they must change. But, be it remembered, the principle of service need not be tampered with. It is as abiding as the moral law. The problem of rethinking deals with the mechanics of approach and treatment. Of old in their isolation, men applied themselves to their fields, bailiwicks, parishes, practices. Today, the same men assemble their strength for endeavors beyond their former dreams. They thought their way in their small preserves as men; now, they plan their progress in national movements in terms of organizations.

Dentistry has had experience in this endeavor. What a private, personal, limited thing education was a score of years ago! Entrance requirements were a mere form. No ethic was attached to their enforcement. The objective was to maintain the schools. The

student as a public servant was overlooked, the public to be served was only vaguely considered. The college profited by the student; the student acquired a craft from the college; the public offered the means of barter. Then new concepts began to emerge. They came up as poplars rise from burnt-over forest. Much rethinking was done. For many, it was new thinking. Even the leaders in the schools had to take a new stance. A fundamentalism developed and a progressivism. Progress seemed slow, but twenty years is short; progress was really rapid. Today, dental education wears its academic trappings gracefully, is a university function, a program of intellectual merit. The school now exists for the student and in a new sense. His credentials have been advanced and are demanded; he must meet the requirements of the new day. Similarly, the school gives a new measure of fitness. It can't take a man because it needs him, nor dismiss one fledged less than the times demand. The public is still the graduate's means of a living; but, for his living, he gives the public the essentials of life.

Again, dentistry had to take inventory of itself. Mechanics had all but throttled it. The profession had become expert in technic and was proud of itself. Then stark disease pointed accusingly at the things that our hands had made. Restoration as a necessity was pardonable in itself and skill praiseworthy but—that necessity! Dentistry must meet it! The gist of that necessity was a quest for causes, how conditions took root and became established. How far this quest has been carried, time has told. And the quest is still on. The program required revitalized faculties, put a new burden on universities, changed the minds of practitioners and gave students a new curriculum. The rethinking process demanded a readjusting of old prides and conceits and the acceptance of new responsibilities. Dentistry had to adopt a new mission.

Latterly, a veering of thought processes has been called for in another field. Dentistry, until recently, was content with a double standard of ethics, one for the individual and another for the group. The man dared not resort to trumpet blowing for gain, make entangling alliances with trade, but, in association and for associational gains, the association might reap from the sowings of commerce. The practitioner dared not advantage himself with the

winds of trade, but the journalism of dentistry set itself in the path of the trade winds to catch the last breeze. The practitioner must be responsible for the welfare of his patient, but journalism might deceive that same patient with claims for nostrums however revolting because of gain. Once more the stance must shift. Then on the wall shadow fingers began to write, the words growing clearer until an indictment was formulated. Not without debate, acid words and recrimination. Again, fundamentalism and progressivism. Some can change; some can't; some will and some won't, but the conviction has grown amain. The rethinking process is on. Illicit advertising, misleading, deceptive advertising as a means of income is doomed.

At this moment, standing before us, hugely dark is the dilemma of a broader service. The question is not "Shall it be done?" but "How?" Dentistry knows that the profession is pledged to it as does medicine. Many would thrust the profession into this difficult terrain as a commander might sacrifice a division of an army in one vast experiment. But a lost division might not imperil the commander's cause: he has other divisions. There is only one professional organization of a kind. Wreck it and the field, the day, the cause are lost. To cope effectively with tidal movements, the agents must multiply their strength and have homogeneity of purpose. Where best and how best can they exert their influence for provident care and wisest ministration are the questions. Not by wanton sacrifice in one madcap plunge into unmeasured depths. But rather with careful analysis, gradual application, a persistent willingness to do what only concentrated force can do, by rethinking.

T.

"FOR DENTAL STUDENTS"

A book recently came to hand bearing the subtitle "For Dental Students." Numerous others bearing the same subtitle have preceded it. Perhaps the authors should not be censured for the resentment the title stirs in some who observe it. These authors believe, honestly enough no doubt, that they are meeting a need, that their

product is the result of their experience and so is justified. Nonethe-less, the resentment felt in some quarters has justification as well and, whatever the motive, the title has none.

The texts so named are not crown and bridgework for dental students or partial dentures for dental students—that would be sheer redundancy—but are one or another of the basic sciences for dental students. For the most part, they are sketchy things, lacking in continuity, without breadth of foundation; books that give results with half explained or unexplained causes that stock the memory with a chaos of data partially or wholly unassociated and therefore unusable. They hark back to the days when courses in the sciences were skeletons of courses prepared for men who obviously would spend their days at the mechanics of dentistry without a disturbing thought of bacteriology or pathology. Practitioners whose diplomas date a decade and a half or more ago recall the compends that served as texts, the outlines, the questions and answers published by teachers. The questions were a line long or less and the answers shorter in many cases. Students with good memories passed the courses with high grades, but small knowledge of the subjects.

In those days and to a much later date in many places, the sciences merely filled in gaps in a heavy program of operative and prosthetic technics and in restorative practice. Teachers without special preparation were drafted for the sciences. They applied themselves to texts and evolved a futile lattice work on which they draped a thin spread of knowledge "for dental students." Old notes from previous courses were laid on lecterns at lecture times. Naturally enough, the students caught the spirit of the procedure. They knew that subjects treated so lightly could form no vital part of the school requirements and the future held no immediate dread. When the science grades were recorded, that ended it except for the mnemonic grind at questions and answers again for the state board.

But these students were in error regarding the future, just as the teachers were. The future for them was to be marked by a surge of science. They were to be amazed by the tidal inflow of science and dazed by their own failure to comprehend it. Many of them would try to fit themselves for the new era by rigid application to texts and journals, to be discouraged in turn by their inability to

get it. In their disappointment, they cursed the days when names, phrases, formulas, epigrams, a mere smattering of facts were good enough for dental students.

Another phase of this attitude recurs. In the hurry to put the student in proper relation to his task, liaisons were made with medical schools, and courses in the fundamentals were taught by medical teachers to dental students. Those courses were abbreviated again at both ends. The student was unprepared to take the regular program of the medical class and the teachers provided by the medical school were either from the lowest rank of the staff or were bored and unsympathetic. What they gave was too often thought, and frequently said to be, good enough for dental students. Is it a surprise that these students resent the phrase?

The next dilemma in which the student found himself was caused by the failure to correlate whatever he may have acquired in biology, physics or chemistry with what he saw or did in the upper classes. The men who taught him his science knew little of dentistry; those who taught him his dentistry knew little of science. This problem, noted by the Curriculum Survey Committee, persists, because schools cannot advance along their entire front at one time: They must take new territory by wedges and segments. This, clearly enough, is no fault of the student's. He is simply the man in the blanket tossed by events. Gradually, this is being overcome, but, in the meantime, the graduates of this régime are not helped by texts for dental students. They have had enough of that sort of thing. And the student of the best curriculums today is aware that such books have no part in his education.

The trend of modern dental education does not recognize sciences for dental students, and it cannot, any more than science itself recognizes dentistry or other subdivisions of medicine. But every subdivision of medicine must recognize the physiology, the pathology, the bacteriology, the chemistry of the body and absorb enough of each to form a working base for the student's endeavors. Less than that, and he fails. So instead of bringing science down to the student, the student must be brought up to the demands of the science. Medicine has evolved a norm for each; dentistry can do with no less. Both see diseases at work, each in his field, but both

may know that what he sees may have effects that he can't see. Thus, a wider knowledge than the old days required is demanded in these days. Add the communication demanded between physician and dentist, add the demands made by the wider spread of general knowledge that the dentist has to meet, and the science "for dental students" formula becomes a meaningless phrase.

T.

PRACTICE IN PARAGRAPHS

This department is intended for busy readers. It aims to tell a vivid story in a few words. Items should be of a practical character, and free from padding—not more than a paragraph or two. We exact no limit, but two hundred words can tell most of these stories. Send in your ideas; they will be welcome.

Determining Bleeding Time—A simple way of determining bleeding time is to stick the end of a finger with a needle, then blot it with a piece of blotting paper repeatedly. Normally, the bleeding should stop in a half-minute. Patients with prolonged bleeding time should not be operated on unless previously prepared.—*James L. Zemsky, 147 Fourth Avenue, New York City.*

Call a Spade a Spade—Charging a fee for one thing and doing something else is a gross misrepresentation. Charging for restorations and making fillings, talking dentures and making plates, stressing prophylaxis and just cleaning teeth, calling pulling removal and designating filling as permanent when records prove that gold foil is the only absolutely permanent filling, are all most unfair to the patient. If everything is called by its proper name and done in the best possible manner, no fee is excessive, if the patient is satisfied with the value received.—*Herbert Ely Williams, Red Bank, N. J.*

Treatment of Facial Swelling—Patients presenting marked swelling of the face or the neck caused by oral infection should not be subjected to extraction immediately, unless this is the only way to liberate the pus present. When the fluctuation can be readily elicited, a free incision should be made over the fluctuating mass, and the pus drained by inserting iodoform gauze strips in the abscess. It is of great importance to determine the etiologic factors in the swelling and to correct them. If this is not done, the condition will not be eliminated and thus may recur.—*James L. Zemsky, 147 Fourth Avenue, New York City.*

Success in Treatment of Osteomyelitis—One of the diseases producing a swelling of the face that should be treated by establishing adequate drainage is acute osteomyelitis of the maxillary bones. Success in the treatment of this condition frequently depends on how conservative the surgeon is. When the operator feels that it is impossible to establish adequate drainage without extracting teeth, he should not hesi-

tate to remove all the teeth that it is necessary to in order to drain the area properly. Sequestra should not be removed until they are entirely separated.—*James L. Zemsky, 147 Fourth Avenue, New York City.*

Reminder Cards—A neatly printed reminder card sent out to patients who have not been in the office for three or four years gives some results. The card reads as follows: Periodical examination and care of the teeth is economy and promotes good health and appearance. It has been some time (no. of months) since your last visit. May I suggest that you make an appointment? Name.....
Address .....Telephone No.....
Of 154 cards sent out in January and April this year, I had forty-three responses for dental work.—*D. E. Yelle, 212 Ludlow Bldg., Dayton, Ohio.*

Silicates—Despite arguments for and against the silicates, with all their semipermanent qualities, these materials have come to stay. Their stay with the profession will be much longer than their stability in a tooth which they fill, and in all fairness, trusting patients must be apprised of the shortcomings and indifferent behavior of silicates when subjected to the chemical reactions of various mouths. Especially since the world has become a cigaret smoking globe, the action of nicotine on silicates often produces shades, tones and hues heretofore thought impossible. Mixed a shade lighter, they may become two or three shades darker later on or blend in with nature's scheme only for a while.—*Herbert Ely Williams, Red Bank, N. J.*

Do Patients Help With Diagnosis?—Is the assistance which a patient tries to render a real asset in diagnosis? Veterinarians receive little or no help in that respect, but are enabled to achieve results comparable with those in the other branches of the healing art. The play of the human imagination often creates nonexisting conditions, the impression being in turn conveyed to the dentist. It seems best to listen attentively, then bring one's judgment and experience to the rescue. The less we say to a patient, the less we have to remember what was said, and if they are told one thing today and something irrelevant tomorrow, their suspicions that we are guessing might react unfavorably. Since Röntgen conceived his science, one is enabled to know more and guess less.—*Herbert Ely Williams, Red Bank, N. J.*

Extractions Unwarranted—It should be borne in mind that extraction of teeth for patients complaining of toothache, but really suffering from other disturbances, such as maxillary sinusitis, parotitis or various types of neuralgia, cannot give any relief. It may only, and frequently does, result in serious trouble for the surgeon. Therefore, extraction of teeth in these cases is not only unwarranted, but also absolutely contraindicated. Nor should the removal of loose teeth which appear to be pyorrheic be undertaken too hastily, for teeth become loose, not only from pyorrhea but also from malignant growths, syphilis, tuberculosis, osteomyelitis and various acute infections. Hence, unless the dentist can positively rule out these serious lesions, extraction of teeth is hazardous and therefore unjustifiable.—*James L. Zemsky, 147 Fourth Avenue, New York City.*

COUNCIL ON DENTAL THERAPEUTICS

ACCEPTED DENTAL REMEDIES

The following articles have been accepted as conforming to the rules of the Council on Dental Therapeutics of the American Dental Association. The Council desires dentists to understand that the admission of an article does not imply a recommendation. A copy of the rules which govern the Council in the consideration of articles will be sent on request.

SAMUEL M. GORDON, *Secretary.*

CALCIUM COMPOUNDS

Calcium Carbonate "50," "70," "100," and "130" Sturge.—Calcium carbonate, Sturge, complies with U.S.P. X (p. 87), used in the manufacture of dentifrices.

Manufactured by John and E. Sturge, Ltd., Birmingham, England. H. J. Baker and Bro., New York, Distributor. No U. S. Patent or Trademark.

PHYSICAL PROPERTIES: Density

"50"	2.82 gm./c.c.
"70"	2.78 gm./c.c.
"100"	2.72 gm./c.c.
"130"	2.72 gm./c.c.

PARTICLE SIZE: The particle size distribution, determined according to the method of Perrot and Kinney (see A.D.R., 1934, p. 66) is claimed to have the following typical distribution:

Diameter (μ)	< 1	1-2	1-3	2-4	3-6	4-6	6-9	9-12	12-15	15-20
% of weight "50"	88		11.98							
"70"	2.9	7.1		37.0		53.0				
"100"					18.0		21.0	39.6	21.4	
"130"					1.9		7.9	18.7	39.1	32.4

ABRASIVENESS: The abrasiveness of calcium carbonate, Sturge, is determined by rotating a polished surface of an antimony (3 Moh's Scale, 250 Bierbaum units (see A.D.R., 1934, p. 67) block (2 by 1½ by ⅜ inch thick, weighing about 60 gm.) in a paste of the chalk and glycerine and water under a weight of 1830 gm. at 1,000 revolutions on a test machine (details filed with the Council). The following weight losses occur:

"50"	0.8 mg.
"70"	1.7 mg.
"100"	2.3 mg.
"130"	4.1 mg.

STERA-KLEEN—NOT ACCEPTABLE FOR A.D.R.

The Council has authorized publication of the following report.

SAMUEL M. GORDON, *Secretary.*

Dr. Sherwin's Stera-Kleen, "The New Idea in Denture Hygiene," is marketed by the Phillips & Benjamin Company of Boston, Mass.

On the receipt of inquiries from dentists concerning the composition of the product, an attempt was made to secure from the promoters a statement of composition, since it is well known that certain products advertised for cleaning dentures are destructive to certain types of dentures, such as those made of aluminum and condensite materials. Both the Council and a teacher in a dental school, who made independent inquiry at approximately the same time, were advised that it was the policy of the firm to consider the composition confidential.

Not only is the product advertised for cleaning dentures, but its use also as a dentifrice is encouraged:

And while it should not be used as a dentifrice, for natural teeth, it is harmless to the teeth and gums.

Accordingly, examination in the A.D.A. Bureau of Chemistry was undertaken.

Stera-Kleen will, in all likelihood, do no more than a dilute solution of trisodium phosphate. This chemical has long been used as a detergent, as for washing dishes and kitchen utensils. An interesting discussion of the use of various sodium phosphates, which may be useful in a further study of substances for cleaning dentures, appears in an article entitled "Sodium Metaphosphate in Mechanical Dishwashing," by Schwartz and Gilmore.[1]

It is apparent from the foregoing examination that if care is not taken to remove the alkali, potentialities for harm are inherent in the product. A case has been reported to the Council in which a patient developed a sore mouth after the use of Dr. Sherwin's Stera-Kleen. The denture was made of luxene, a material heretofore giving no trouble. When use of Stera-Kleen as a cleaning powder was discontinued, the trouble disappeared.

It is also apparent that the use of Stera-Kleen as a dentifrice is objectionable, because of the strong degree of alkalinity, due to the trisodium phosphate and to the sodium perborate content, which has been known to give rise to untoward reactions in the mouth.

In view of the foregoing, Stera-Kleen is declared not admissible to A.D.R.

The A.D.A. Bureau of Chemistry report follows:

DR. SHERWIN'S STERA-KLEEN

Two original packages of Dr. Sherwin's Stera-Kleen (Phillips & Benjamin Co., Boston, Mass.), price, 60 cents each, were purchased on the open market for examination.

The following appears on the carton:

Safely Cleanses Artificial Teeth *Without Brushing* Avoid *Denture Breath* by using STERA-KLEEN. Avoid *Hot Mouth* (Hot Plate) by using STERA-KLEEN.

Avoid the fear of *Direct Breath Contact* and avoid *Rough Dentures* by using STERA-KLEEN.

Avoid *Denture Trouble* by using STERA-KLEEN. Read insert carefully. Keep in a dry place, or in room where temperature is not *over 100°* Fahrenheit.

The following appeared on the circular enclosed in the package:

STERA-KLEEN (Formula of Dr. L. W. Sherwin)

A New Scientific Discovery

Stera-Kleen Removes Stains, Tartar, Mucin and Food Débris Without Using Abrasive Powders or Injurious Acids.

Recommended by the Dental Profession.

The following appeared on the principal label:

DIRECTIONS FOR USE: Place level teaspoonful of powder in a glass or container holding your plates or removable bridges. Add enough water (preferably warm) to cover plates and allow to stand 5 to 15 minutes or longer.

In other advertising, the user is directed to dissolve the contents of a "capful" in enough warm water to cover the plate.

The contents of the bottle examined contained 101.8 gm. (approximately 3⅓ ounces) of a white easily flowing powder, with an odor suggestive of peppermint and cinnamon.

The contents of a "capful" weighed 4.5 gm. An aqueous solution gave an alkaline reaction to phenolphthalein (p_H 9-10).

Qualitative examination indicated the presence of sodium, potassium, chloride, borate and an iodine-liberating compound (perborate), carbonate and chloride. Sulphate was not found.

1. Schwartz, G., and Gilmore, B. H.: Indust. & Eng. Chem., 26:998 (Sept.) 1934.

Quantitative examination yielded the following:

Chloride (Cl^-)	18.6 per cent
Available oxygen	4.5 per cent
Phosphate $(PO_4^-)^{--}$	9.4 per cent
Carbon dioxide (CO_2)	0.7 per cent
Cc. 0.5 N acid required for neutralization of 1 gm.	9.5 per cent

The chloride (Cl^-) and phosphate $(PO_4^-)^{--}$ were calculated to sodium chloride ($NaCl$) and trisodium phosphate monohydrate ($Na_3PO_4H_2O$). The available oxygen was calculated to sodium perborate on the basis of the National Formulary requirement of not less than 9.0 per cent available oxygen. The carbon dioxide was neglected, as it is known that trisodium phosphate is alkaline enough to take up carbon dioxide. Therefore, it may be calculated from the foregoing that Dr. Sherwin's Stera-Kleen contains essentially:

Sodium chloride	30.6 per cent
Trisodium phosphate, monohydrate	18.0 per cent
Sodium perborate (9 per cent available O_2)	50.0 per cent

From the foregoing, it may be concluded that a mixture having the essential composition of Dr. Sherwin's Stera-Kleen may be made by mixing together by weight:

Sodium chloride	30 parts
Trisodium phosphate, monohydrate	20 parts
Sodium perborate	50 parts

Each measure of the product would contain from 1 to 1.25 gm. of trisodium phosphate.

SODIUM PERBORATE: LIMITATIONS OF ITS USE

The following article is presented as one in the Council's series on pharmacology and therapeutics.

SAMUEL M. GORDON, *Secretary.*

The increasing number of injurious burns of the oral mucosae from the indiscriminate use of sodium perborate has led to serious misgivings concerning unbridled drug exploitation. Recently, the use of the chemical for other than strict medicinal uses in the mouth has spread. This is undoubtedly due to an indiscriminate demand created partly by alluring advertising to the public through dentists and directly to the public by means of the radio.

The use of sodium perborate as part of the treatment of Vincent's infection and related conditions is well known. Such uses are therefore not considered in detail here. The ill-advised recommendation of this drug for use as a mouth wash,[1] dentifrice, bleach for the teeth, oral hygiene agent and preventive of "pyorrhea" and trench mouth, without individual attention by a qualified dentist, is at least against the public interest, if it is not becoming a public nuisance. (Notice of Judgment 21176 [issued August, 1934] for violation of the Food and Drugs Act of 1906, as amended, is of interest in this connection. Sodium perborate, flavored with spearmint oil, was found on bacteriologic examination not to be antiseptic when used as a mouth wash. Furthermore, the following statements on the label regarding the curative or therapeutic effects were false and fraudulent: "Recommended as a prophylactic for the teeth and gums, helpful in the treat-

1. The chemistry of the perborates is described in Mellor's Inorganic and Theoretical Chemistry V, 115, et seq.

ment of pyorrhea, trench mouth and gingivitis. Especially helpful in cases of sore or infected gums." Since the present Food and Drugs Act gives officials no jurisdiction over periodical or radio advertising, such false and fraudulent claims can be made in and through these mediums with impunity. Sodium perborate by itself is of course not a medicament for use in the above-mentioned diseases.) Its inclusion as an ingredient of dentifrices for daily use, without a dentist's prescription, appears to be based on nothing more logical than the fact of the expiration of certain patents (760,397 and 802,099). The general appearance of tooth powders containing sodium perborate appears to be coincident with the expiration of these patents. This may explain also in part the newly found wonders of sodium perborate, a discovery which may be laid to the wit of advertising copy writers. It is therefore of interest to review briefly the chemistry and actions of this drug.

Sodium perborate is assigned the chemical formula $NaBO_3 4H_2O$. It was first prepared in 1898 and it remained more or less of a chemical curiosity until its large scale production, about 1906.[1]

Sodium perborate when pure yields about 10 per cent of available oxygen when treated with potassium permanganate in the presence of sulphuric acid or under similar conditions. In the mouth, where these conditions do not prevail, the amount of oxygen given off rarely ever reaches this amount.

When it is dissolved in water, the following reactions theoretically ensue:

$$4\ NaBO_3 + 5\ H_2O \longrightarrow 4\ H_2O_2 + 2\ NaOH + Na_2B_4O_7$$
$$Na_2B_4O_7 + \ H_2O \longrightarrow 2\ H_2BO_2 + 2\ NaBO_2$$
$$2\ NaBO_2 + 2\ H_2O \longrightarrow 2\ HBO_2 + 2\ NaOH$$
$$4\ NaBO_3 + 8\ H_2O \longrightarrow 4\ H_2O_2 + 4\ NaOH + 2NaBO_2 + 2HBO_2$$

The dilution and temperature determine the completeness of the reactions. For the present purpose, it is important to note the appearance of sodium hydroxide. It is this fact that may account for the effects noted on the mucosae and which should urge caution in its use.

The liberation of oxygen in an alkaline medium led to the substitution of sodium perborate for hydrogen peroxide (3 per cent solution), which had been stabilized by the addition of small amounts of sulphuric acid, but, as will be mentioned further on, the liberation of oxygen in the mouth is apparently not complete. No carefully controlled tests are available to demonstrate the difference between the use of hydrogen peroxide, 3 per cent solution, and sodium perborate in the treatment of trench mouth.

Sodium perborate may be listed among the more insoluble of the common sodium salts. Its solubility in water at 25 C. is 1 part in 37 parts of water. The rate of decomposition is dependent on the temperature, the evolution of oxygen beginning at about 40 C. and increasing with rise in temperature. The average mouth temperature is several degrees lower; namely, 37 C. This point, together with the common belief that sodium perborate in the mouth gives off large amounts of oxygen, is important in interpreting the benefits laid to the use of sodium perborate in treating diseases of the mouth associated with anerobic organisms. That sodium perborate does not liberate the theoretical amount of oxygen when dissolved in water was reported by Bacon and Van Natta in 1931.[2] When it was dissolved in saliva, larger amounts were given off, and it is probable that certain ferments like catalase may accelerate the reaction. It is probable that the reaction may proceed to completion to the final stages in the equation above, but what stages of the reaction take place in the mouth remains a moot point. It would be interesting to study the volume of oxygen liberated in various buffers whose p_H approaches that of saliva. Coincident

2. Bacon, F. J., and Van Natta, H. C.: Preliminary Report on Use of Sodium Perborate in Dentistry, J. D. Res., 11:460 (June) 1931.

and more important for this discussion is the high alkalinity in terms of sodium hydroxide present at any stage of the reaction. Thus, if not carefully removed by rinsing, small deposits of the chemical may collect and cause inflammation and necrosis of the oral membranes, the so-called "burn," etc., due to the alkali.

Sodium perborate was introduced into medicine and dentistry about 1910. Bloodgood, in 1910, and Letard, in 1913, suggested its use in the treatment of Vincent's infection. Up to relatively recent times, its use was generally confined to sale on prescription.

Few untoward incidents were noted during this time; a circumstance which may be explained by its circumscribed use for relatively short periods and possibly to the directions for frequent rinsings of the mouth, a factor which is not negligible in the control of the disease. General interest in the product as a medicament appears to be declining since it was official in the ninth edition of the Pharmacopeia, but it is not listed in the tenth. It is listed in National Formulary V. (It should be remembered in this connection that the Pharmacopeia is a joint project of pharmacists and physicians, while the National Formulary is a project of pharmacists. The revision committee of the U.S.P. is composed largely of physicians, while the revision committee of the National Formulary is composed almost entirely of pharmacists.)

The indiscriminate and popular use of sodium perborate appears to be largely due to the Vince Laboratories, of New York, which was among the first to introduce a sodium perborate preparation made "palatable" by the addition of various essential oils. After its introduction for the treatment of pyorrhea and trench mouth, via dental journals, the product was subsequently advertised over the radio with claims for its use as a general oral hygiene agent, mouth wash, oxygen liberator, tooth bleach and dentifrice; and hence its broad use by the public without competent dental or medical supervision was established. As in the case of other unessential modifications of well-known substances, other flavored sodium perborate preparations followed. Subsequently, the perborate tooth powders came on the market.

There is no carefully controlled evidence available that the daily use of sodium perborate in normally healthy mouths is beneficial to the health of the gums, that it bleaches teeth when applied externally or that its use prevents diseases of the gums, barring untoward incidents. The casual manner in which brushing the teeth is generally carried out provides opportunity for small deposits of the drug to remain in the mouth.

Considering the chemical composition of the product and its wide-spread use, it was not surprising that undesired reactions began to be noted. In 1931, Hirschfeld[3] reported several cases of "chemical burns," hairy tongue and edema of the lips from the ill-advised use of sodium perborate. Hirschfeld pertinently states:

> The patient was influenced by an advertisement to use a certain preparation of sodium perborate for inflamed gums. The lining of the cheeks and lips became a heavy mass of necrotic tissue within a few days. After the perborate wash was discontinued, the burn healed rapidly. Although the solution used (1 tablespoon to the glass) is easily tolerated by the average person, clinical experience indicates that about 20 per cent of patients cannot use the drug stronger than a teaspoonful to three-quarters of a glass of water without sustaining a burn of a greater or less degree.

The manifestations disappear on the removal of the drug, but one must bear in mind the possibility of secondary infection.

Considering the direct and indirect potentialities for harm in the indiscriminate and unwarranted use of the drug, the Council desires to point out that employment of the drug should be limited to use under the supervision of dentist or physician and preferably on prescription rather than by mention of a name which has been popularized in the

3. Hirschfeld, Isadore: Vincent's Infection of the Mouth: Clinical Incidents in Its Diagnosis and Treatment, J.A.D.A., 21:776 (May) 1934.

patent medicine manner. Attention should also be directed to the necessity for removal of this drug by thorough rinsing and the desirability of discontinuing its use when it is no longer required as part of the treatment.

At the recent meeting of the Council, the following stand was adopted: 1. Sodium perborate is considered as a drug, i.e., to be used in the treatment of disease, and not for general oral hygiene uses. 2. No toothpowder containing it will be accepted for, or retained in, A.D.R. unless evidence is submitted that the potentialities for harm are removed by such admixture and the dentifrice containing it is more efficacious in cleaning the surfaces of the teeth than a closely analogous mixture which does not contain sodium perborate.

Patio Royal, where luncheon and tea are served in one of the most famous historic spots in the French Quarter, New Orleans.

BUREAU OF PUBLIC RELATIONS

PUBLIC HEALTH ASPECTS OF VINCENT'S INFECTION

By J. M. WISAN,* D.D.S., F.A.P.H.A., Elizabeth, N. J.

THE growing prevalence of Vincent's infection, commonly known as trench mouth, calls for closer study of this painful disease by all those concerned with public health. As a "specific infection caused by definite and well-known types of micro-organisms,"[1] which are transferable from one person to another, it demands the united attention of health officials, dentists and physicians.

INCIDENCE

Government reports, newspaper items, medical journals and correspondence with physicians give proof that epidemics are occurring throughout the country and that the disease is on the increase in many communities. The summaries of communicable diseases in the weekly reports published by the United States Public Health Service include cases of this disease as occurring in the following states during the years 1933, 1934 and 1935: Oregon, Washington, Oklahoma (exclusive of Oklahoma City and Tulsa), Maine, New Mexico, Maryland, New York (exclusive of New York City), Tennessee, Illinois, Montana, North Dakota, Colorado, Kansas, Iowa, Indiana, Wyoming, South Carolina and Michigan.

A particularly noticeable increase in the disease during the past three years is shown by the reports from New York State and from Illinois. While it was less prevalent in New York during 1933 than during 1934, the figures took a decided jump in 1934. In May of that year, 564 cases were reported, an increase of 486 over the previous month's report, bringing the year's total to over 700 more cases than in 1933. In Illinois, over 700 victims were reported during 1934, as compared with slightly over 600 in 1933 and only about 300 in 1932.

Epidemics reported by city health departments and called to public attention through newspapers give additional information on the incidence of the disease. In Battle Creek, Mich., during October, 1933, about 120 students in one of the schools became infected from two carriers, and in the following October there were eighty-five cases in the town.

In December, 1933, one of the largest cities in New Jersey, identity of which the authorities wish to conceal, reported 350 positive cases of Vincent's infection, each child having had a smear which was sent to the laboratories. The report stated that the condition was not in only one section, but at both ends of the city.[2] In 1934, two epidemics of trench mouth were uncovered in the State of New Jersey during a state-wide children's dentistry project conducted under the joint

*Chairman, New Jersey Council on Mouth Hygiene, State Dental Supervisor, New Jersey E.R.A. Children's Dentistry Project.

1. Kronfeld, Rudolf: Histopathology of the Teeth and Their Surrounding Structures, Philadelphia: Lea and Febiger, 1933, p. 297.

2. Letter to the author.

supervision of the New Jersey State Dental Society, the New Jersey State Department of Public Instruction and the Emergency Relief Administration, to provide dental treatment for indigent children.

Last fall, Irvington, N. J., reported five cases in hardly more than a month's time, and Hagerstown, Md., was also fighting an epidemic.

During January, 1935, Yakima, Wash., had eight cases among school children; there was an epidemic in New Bern, N. C., and a member of the Chicago Cubs lost 11 pounds after a ten days' siege with the disease.

This spring, the disease gained such headway among school children and adults in the San Luis Valley section of Colorado that the American Red Cross inaugurated a three-months' campaign in five counties, to prevent further cases and cure existing ones. W. E. Goodrow, of Del Norte, Colo., May 20, 1935, reported[3] that of a total of 2,289 children examined, 855 were found to be suffering from Vincent's infection.

It is significant that physicians throughout the country are reporting an increased number of cases. Statements from three prominent Texas physicians show the situation in that section.

After investigation of trench mouth conditions in Texas, J. J. Crume states[4]: "There are no doubt many cases existing today that have never been diagnosed because of the mildness of the attack."

V. R. Hurst, of Longview, reports[5]: "During the last few years, there has been a very marked increase in the number of cases of Vincent's infection in our section."

William D. Gill, of San Antonio, Texas, states[6]: "Vincent's infection is more prevalent than is generally supposed and is apparently on the increase."

In a talk at the annual meeting of the Medical Society of New Jersey, Allen G. Ireland, director of physical and health education, New Jersey State Department of Public Instruction, made the following statement: "I have received more requests from school physicians for information about Vincent's infection than anything else."

From such widely scattered comments as these, it is evident that, throughout the whole country, the health professions face a serious task in checking this disease.

To combat Vincent's infection intelligently, it is essential to look at it from three points of view: (1) professional aspects, including nomenclature, etiology, symptoms, diagnosis and treatment; (2) personal care as a preventive measure, and (3) public health implications. Under these main headings, I present a summary of authoritative opinions, together with suggestions for the control of the disease.

PROFESSIONAL PHASES

Nomenclature.—While the lay term "trench mouth" or the professional name "Vincent's infection" is usually applied to the ailment, it is given various other designations by medical and dental authorities. Among the other terms often used are the following: ulceromembranous gingivitis, necrotic gingivitis, Vincent's disease, Vincent's stomatis, stomatitis ulcerosa and Vincent's angina.

"Vincent's angina" is used by the Index Medicus of the American Medical Association in listing articles on the sub-

3. Letter to the author.

4. Crume, J. J.: Vincent's Infection or Trench Mouth, Texas J. Med., 29:587 (Jan.) 1934.

5. Disc. Crume, Footnote 4, p. 589.

6. Gill, W. D.: Texas J. Med., 29:12 (May) 1933.

ject. According to Mead,[7] "Vincent's angina is usually understood to mean a manifestation of a more serious form of this disease in the tonsils and throat." In the weekly reports of the United States Public Health Department, this classification is used up to October, 1933, and from then on it is abandoned in favor of Vincent's infection. What may be considered an authoritative opinion on the difference between the two terms is given by L. Pierce Anthony,[8] chairman of the Committee on Dental Nomenclature: "Vincent's infection—To be used to express the ulceromembranous stomatitis caused by Vincent's spirillum and fusiform bacillus in preference to Vincent's angina, the latter being more applicable to the throat infection."

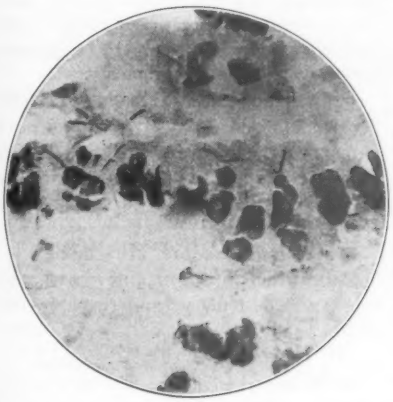


Fig. 1.—Smear obtained from normal mouth.

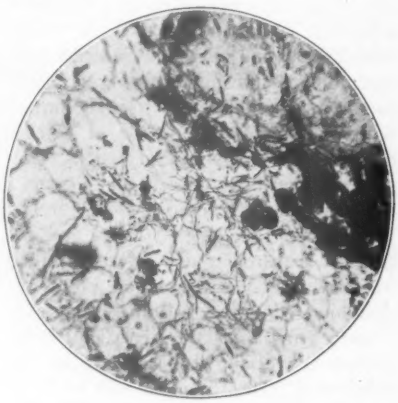


Fig. 2.—Smear obtained from mouth showing symptoms of Vincent's infection.

Etiology.—All authorities agree with Mead's statement that the causative organisms of ulceromembranous gingivitis (Vincent's disease) are *Bacillus fusiformis* and the spirillum *(Borrelia vincenti)* of Vincent and Plaut, and that the constant appearance of these organisms in lesions of ulceromembranous gingivitis, and their disappearance on treatment have led to the belief that they are the bacteriologic factor in the disease.

"The contagiousness of the disease," Mead adds, "was well illustrated by its occurrence in the mouths of large groups of men during the war."[9] Undoubtedly, this fact was responsible for the name "trench mouth."

It is well established, then, that the transmission of these disease-producing germs is responsible for Vincent's infection. Consequently, it becomes the duty of every health official to find out how the germs are transmitted and to "police" the traffic lines as far as possible.

Certainly any practice that will carry the pathogenic micro-organisms from a diseased mouth to an unaffected one is a factor in infection. Generally, the disease

7. Mead, S. V.: Diseases of the Mouth, St. Louis: C. V. Mosby Co., 1932, p. 515.

8. Anthony, L. P.: Report of Committee on Dental Nomenclature, J.A.D.A., 10:1043 (Nov.) 1923.

9. Footnote 7, p. 516.

is spread by one of the following practices: (1) the use of eating and drinking utensils previously infected, (2) eating of food made infectious by another person and (3) kissing an infected person.

Regarding the first item, S. A. Swayne, M.D., says[10]: "Another factor in the wide-spread prevalence of the disease is the increased exposure to infection by using improperly cleaned eating utensils at hotels, restaurants and especially roadside stands."

P. G. Puterbaugh, M.D., D.D.S., enumerates[11] a number of ways in which the disease may be conveyed. "Vincent's infection," he warns, "may be transmitted by either direct or indirect contact; directly, through kissing or other contacts, and indirectly, through contact with drinking cups, mouths of bottles, eating utensils, pipes, lead pencils, telephones, doorknobs, towels and unsterile hands and instruments."

The condition of the tissues and the general health are also related factors. Medical and dental opinions point out that lowered tissue resistance favors increased growth and virulence of the organism and allows deeper invasion. "A debilitated state of health and oral uncleanliness adds to the susceptibility to the disease."[4] Conditions that contribute to lower tissue resistance are: (1) lack of oral hygiene and the proliferation and invasion of the pathogenic germs and (2) gingival irritation and inflammation, which make gums more susceptible to Vincent's infection.

Mead lists[12] the following as concerned in susceptibility of persons to this infection: dietary deficiencies, wasting disease, fatigue, smoking, trauma and scurvy. Dalitsch declares[13]:

Lowered resistance of the tissues is seen especially in the mouth as a result of any of the following factors: (1) vascular changes as seen in scurvy and secondary purpura; (2) blood dyscrasia, as in anemia; agranulocytosis, leukemia, essential purpura, etc.; (3) trauma and irritation from poor fitting prostheses, calculus, food débris, faults of occlusion; (4) chemical toxins, as in mercurial and bismuth stomatitis (excessive use of tobacco may be listed here); (5) infections with other bacteria (streptococci, staphylococci and tubercle bacillus infections may have a superimposed fusospirochetal infection); (6) dietary deficiency, which may, because of a lack of protective accessory food substances, cause a tissue susceptibility.

F. C. Cady, M.S., U. S. Public Health Service states[14] that "free margins of gums, pyorrhea pockets, defective fillings, defective bridge abutments—all places that cannot be cleaned—are convenient for infection."

Symptoms.—Isadore Hirschfield, Jr., classifies the infection into two main types: the destructive and the hypertrophic.

Dr. Hirschfield writes[15]:

In the destructive type, the outstanding clinical symptoms are ulceration and sloughing of the marginal gingivae, especially interproximally. The necrotic layer, a yellowish white or grayish white, may be easily wiped off its highly inflamed base. The lesion thus exposed is extremely painful and bleeds freely on the slightest provocation.

There is usually present a characteris-

10. Swayne, S. A.: Trench Mouth, Trained Nurse & Hosp. Rev., p. 126.

11. Puterbaugh, P. G.: Vincent's Infection, J.A.D.A., 21:1926 (Nov.) 1934.

12. Footnote 7, p. 516.

13. Dalitsch, W. W.: Vincent's Stomatitis and Related Infections, J.A.D.A., 21:1257 (July) 1934.

14. Cady, F. C.: J. D. Res., 13:61 (Feb.) 1933.

15. Hirschfield, Isadore: Vincent's Infection of Mouth: Clinical Incidents in Diagnosis and Treatment, J.A.D.A., 21:768 (May) 1934.

tic pungent and fetid breath odor and the patient may complain of a metallic taste and increased salivation.

To quote again from Dr. Hirschfield[16]:

> In the hypertrophic type of Vincent's infection, the subjective and objective symptoms are the same as in the destructive, but, as the term implies, there is a marked acute gingival hypertrophy, with or without macroscopically evident necrosis. (Usually, even if a necrotic border is evident, there is little loss of gum tissue as an aftermath.)

of Vincent's infection as: (1) acute stomatitis tending to run a self limited course and (2) chronic gingivitis tending to persist.

In comparing Vincent's infection with pyorrhea, Kronfeld states[18]:

> The gingival tissue (in Vincent's infection) shows a marked tendency to necrosis. . . . Furthermore, Vincent's infection is decidedly painful; whereas, pyorrhea is never accompanied by pain except in the case of rare lateral abscesses.

The trench mouth lesion is most fre-

American Red Cross
San Luis Valley
Oral Hygiene Project

Date Examined 5/20/35

Name Doe, John. Age 18 Sex M Nationality Amer.

Address Del Norte, Colo. School District Del Norte County

EXAMINATION
Vincent's Infection ✓

CLINICAL DIAGNOSIS
Positive
Suspicious
Acute ✓
Chronic

LOCATION OF LESIONS
Gums
Upper { Anterior ✓ / Posterior ✓
Lower { Anterior ✓ / Posterior ✓
Tonsils yes

LABORATORY DIAGNOSIS
Positive ✓ Negative
Treatment Advised No. I

HISTORY OF INFECTION
Time of Onset
Onset Abrupt with Acute Illness (45)
Onset Insidious without Acute Illness ( )

OTHER MEMBERS OF FAMILY
Eight in Number
Adenitis yes. acute

MALNUTRITION
Height: 5'8" Weight: 140

DENTAL EXAMINATION
Blue Spongy Gums Without Ulceration yes

ABSCESSED TEETH
Upper 2
Lower 3

EXTRACTIONS RECOMMENDED
Upper Teeth—Permanent 2 Deciduous
Lower Teeth—Permanent 4 Deciduous

Referred To: Red Cross Clinic

Examiner: W. E. Goodrow Nurse: Hattie Keller

Fig. 3.—Patient's record card used last spring by the American Red Cross during the oral hygiene project in the San Luis Valley, Colorado.

In some cases, the papillae alone become hypertrophied; while, in others, the entire gingiva swells, covering a considerable portion of the crowns of the teeth, a condition existing that is not unlike the hypertrophy in acute lymphatic leukemia. Such cases appear quite often, and the condition needs to be differentiated from other types of gingival hypertrophy.

Lathrop classifies[17] the mouth lesions

quently found on the gingiva of one tooth or it may extend throughout the mouth, also to lips and cheek. As stated above, when the infection affects the tonsils and throat, it is called Vincent's angina.

Mead[19] lists the following symptoms:

Saliva—thick, viscid white in character.

Coating of tongue—whitish or yellowish coating.

16. Footnote 15, p. 769.
17. Lathrop, F. W.: J. M. Soc. New Jersey, 31:40 (Jan.) 1934.
18. Footnote 1, p. 297.
19. Footnote 7, p. 524.

Fever—temperature usually between 99 F. and 101 F.

Subjective symptoms—Pain: interfering with brushing of teeth and mastication of food and sleep. Taste: disagreeable, metallic.

Chronic Cases—symptoms similar to those in acute attack assists in determining the presence of the infection.

General Symptoms—malaise, mental depression.

Diagnosis.—The presence of Vincent's infection may be detected by the observation of the above mentioned symptoms, and by microscopic examination of smears.

F. L. T. Appleton[20] describes the micro-organism associated with Vincent's infection as follows:

Fusiformis dentium is an anaerobic rod with pointed ends, 0.8 to 1 by 5 microns, showing from 2 to 6 deeply staining granules. Gram positive. To the spirochete is given the name *Borrelia vincenti,* which is an anaerobic, flexible filament, 0.3 by 10 to 20 microns, with 3 to 5 large wavy spirals.

The fusiform bacilli and the spirochetes are generally regarded as distinct species acting in symbiosis. (Figs. 1-2.)

The finding of the spirilla and fusiform bacilli easily stained by basic dyes such as gentian violet is not conclusively diagnostic because such organisms occur in any dirty mouth.[21]

In view of the opinion expressed by some observers that the presence of these organisms is not always indicative of Vincent's infection, the following statement of Appleton's is significant[22]:

Over a long period I have examined smears from many hundreds of young adult mouths (students of ages 18-25 years). Most of these smears did not show spirochetes. In every case in which spirochetes were demonstrable there was found something clinically wrong to explain their presence.

Rosenthal[23] gives the following as a quick and convenient method of preparing smears: The material is collected by gently rubbing a sterile platinum loop, swab, currette or excavator over the parts. Transfer is made in a broad, thin smear to a glass slide which has previously been washed clean, dried and flamed. The material is allowed to dry; then fixed by quick passing of the slide three times through a Bunsen flame. Sufficient of a 2 per cent aqueous solution of gentian violet is added to cover the film completely. This is washed off in fifteen seconds with tap water and blotted dry. A drop of cedar oil is added and the result viewed with an oil immersion objective. The entire procedure requires about two minutes.

Frederick James[24] offers these directions for the following interpretation of smear studies:

(1) Microscopic findings must be considered conjointly with clinical findings in making diagnosis.

(2) Large numbers of spirochetes and fusiform bacilli and relatively few of other bacterial types make a positive diagnosis.

(3) Treatment should be continued until smears show no spirochetes and fusiform bacilli.

(4) In some cases it may be necessary to distinguish between the ulceration caused by *Bacillus diphtheriae* and that caused by the spirochete of Vincent's angina. Film preparations will, as a rule, settle the question of Vincent's angina immediately, but it must not be overlooked

20. Appleton, F. L. T.: Bacterial Infection, Philadelphia: Lea and Febiger, 1933, pp. 578, 579.

21. Therapeutics of Cook County Hospital, edited by Bernard Fantus, J.A.M.A., 104:741 (March 2) 1935.

22. Footnote 20, p. 581.

23. Rosenthal, S. L.: Vincent's Infection—Acute, Subacute and Chronic, J.A.D.A., 20: 438 (March) 1933.

24. James, Frederick: Principles of Dental Histo-Pathology, Clinical Pathology and Therapeutics, Ed. 2, Ann Arbor: Edwards Brothers, Inc., 1934, p. 374.

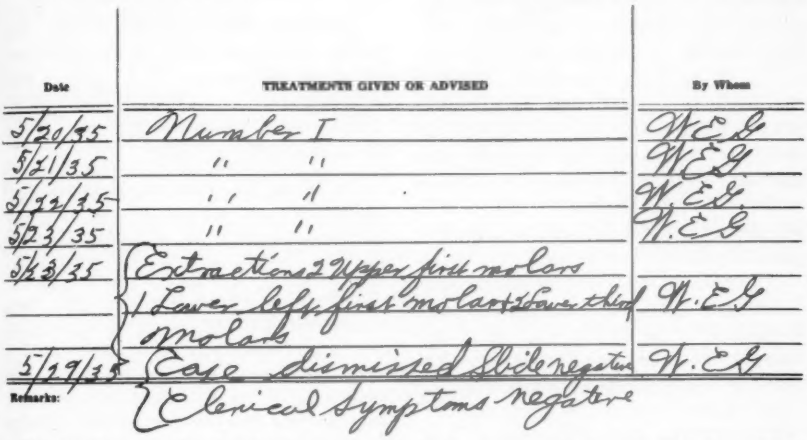
that occasionally the Klebs-Loeffler bacillus may be found associated with the condition. It is well, therefore, where a disease affects the throat, to make the usual bacteriological examination for *Bacillus diphtheriae*, using Loeffler's special serum.

Appleton says[25]:

> The presence (of Vincent's spirochetes and fusiform bacilli) in the absence of true Vincent's infection means that the patient is a carrier. As such he is capable of transmitting the infection to others and he is also likely to contract the infection himself whenever, for any reason, the resistance of the oral mucosa is lowered.

complications that may result from trench mouth: (1) rapid destructive ulcerations about the teeth, (2) extensive ulcerations about the tonsillar region, (3) erosion of the large vessels in the neck, (4) invasion of adjacent cavities—nasal sinuses, antrum, middle ear, etc., (5) osteomyelitis, (6) bronchial spirochetosis and (7) lung abscesses.

Fatalities.—While Vincent's infection is seldom fatal, deaths have resulted from the disease. One death is mentioned in an account[27] of an epidemic in Westport, N. Y., in September, 1931. In the fall



Date	TREATMENTS GIVEN OR ADVISED	By Whom
5/20/35	Number I	W.E.G.
5/21/35	" "	W.E.G.
5/22/35	" "	W.E.G.
5/23/35	" "	W.E.G.
5/28/35	Extractions 2 Upper first molars	
	Lower left first molar & lower third molars	W.E.G.
5/29/35	Case dismissed Slide negative	W.E.G.

Remarks: Clinical symptoms negative

Fig. 4.—Reverse side of patient's record card showing treatments given by Red Cross Clinic during the San Luis Valley (Colorado) project.

An excellent method of recording statistics was used by the American Red Cross, San Luis Valley, Colorado, Oral Hygiene Project. (Figs. 3-4.)

Possible Complications.—"In severe cases," states Appleton,[22] "the gum tissues and even the underlying alveolar bone were destroyed, the teeth might be exfoliated or their roots might remain largely exposed after healing."

Dr. Gill presents[26] a list of possible

of 1934, a dentist of Watseka, Ill., died from trench mouth, the fatality being precipitated by the extraction of a tooth, and another man died from the disease in Fort Wayne, Ind.

TREATMENT

What are the methods of treatment which are proving most effective in curing Vincent's infection? And to what extent is its cure a dental problem?

S. A. Swayne[27] writes:

25. Footnote 20, p. 592.
26. Footnote 6, p. 9.
27. Footnote 10, p. 127.

Where the lesions are on the gums and around and between the teeth, it seems to me that it is a problem for the dentist and that *most prompt and permanent* results can be obtained by him. Removal of calcareous deposits and treatment of pyorrhea pockets are of prime importance, and dental appliances that infringe upon or irritate the soft tissues should be corrected. . . . Certainly before a permanent cure can be effected all dead and necrosing tissue must be removed and the vitality of the gums must be increased.

Arthur H. Merritt[28] outlines a method of treatment which, according to many references in dental literature, has been adopted by a number of prominent dentists. Briefly, his treatment consists of: (1) applying 5 per cent chromic acid to the teeth and periodontal tissues; (2) polishing the surfaces of the teeth; (3) spraying the mouth; (4) carefully scaling and curetting each dental crevice and pocket; (5) again bathing the gums with solution of chromic acid, and (6) further polishing and taping the teeth.

The patient is advised to refrain from drinking alcohol and from smoking and to include in the dietary fruit juices and dairy products in liberal quantities. Dr. Merritt recommends a mouth wash of:

Hydrogen dioxid aquae, 8 ounces.
Mercury bichloride, 2 grains.
Sig. Two teaspoonfuls in a half-glass of warm water; use every hour as a mouth wash.

As to the number or frequency of treatments, Dr. Merritt[29] writes:

Usually from once a day to once a week, and from three to half a dozen times, will clear up most cases. . . . All treatment is directed to one end; namely, the establishment and maintenance of a high order of mouth hygiene with a view to reducing the Vincent organisms and promoting local resistance. . . . With the case under control the patient is taught how to take care of the mouth, and proper brushes and dentifrice are prescribed. . . . Unfortunately, infection by the Vincent organisms does not create immunity.

Dr. Crume[30] advises the use of 5 per cent arsphenamine in glycerine as a local application and, for severe cases, intravenous medication with arsphenamine.

Dr. Gill[31] recommends daily smears for five successive days as a check. He writes: "If at the end of the fifth day, smears are still positive, I feel justified in using intravenous arsphenamine therapy."

Relative to the treatment of cases last spring among children in the grammar school of Allentown, N. J., which may be considered a rural community, E. F. Thompson, supervisor of Monmouth and Ocean counties, writes[32]:

On March 9th, smears were taken of all suspicious cases and sent to the Bacteriological Laboratory of the State Department of Health. Thirty cases were found to be positive. Treatment was started immediately in the school clinic which was established and, later, work was transferred to a private dentist's office, where it was continued. On May 17th, all cases were cleared up and negative smears obtained. The treatment consisted in using neo-arsphenamine, applied locally, in the office, followed by sodium perborate mouth wash and paste applied locally at home, following a thorough prophylaxis. Some of the cases after being cleared up were reinfected at home. However, finally the situation was controlled. There were 158 treatments given in all.

Most authorities sound the following warnings: 1. Scaling should not be instituted during the acute stage. 2. Extraction of teeth should be avoided during the acute stage. 3. Toothbrushes used

28. Merritt, A. H.: J. D. Res., February, 1933, Vol. XXII, No. 1, pages 57-60.
29. Footnote 28, p. 59.
30. Footnote 4, p. 588.
31. Footnote 6, p. 11.
32. Letter to the author.

before treatment was instituted should be discarded.

Up to this point, we have been concerned only with manifestations of Vincent's infection. But the maintenance of public health is a matter of protection as well as of cure, calling for the adoption of measures by individuals and by communities, to prevent the onset and transmission of the disease. As the carrying out of these measures depends on the cooperation of all citizens, public health officials, dentists and physicians, a separate list is made of the responsibilities which each group should assume.

PERSONAL CARE

Every individual can protect himself against Vincent's infection by: (1) avoiding drinking and eating utensils that may be infected; (2) avoiding contact with infected persons; (3) obtaining skilful dental treatments regularly with the view to maintaining mouth health; (4) keeping the mouth clean; (5) selecting adequate and complete foods: (*a*) milk, (*b*) dairy products, (*c*) fresh fruit (especially citrous fruits) and (*d*) vegetables, and (6) maintaining systemic health.

In view of the widespread practice of using a sodium perborate dentifrice as a preventive against Vincent's infection, the announcement of the Council on Dental Therapeutics of the American Dental Association should receive due notice.[33]

DENTIFRICES

The Council's discussion on dentifrices revolved principally around the use of sodium perborate *per se* and its use in dentifrices, particularly tooth powders. The indiscriminate use of such products has led to the frequent appearance of untoward effects such as burns of the mouth, edema of the lips and conditions which might develop in their wake.

The Council holds that the indiscriminate use of sodium perborate alone or in tooth powder or tooth paste in the daily hygiene of the mouth, except under close medical or dental supervision, is contrary to the interests of the user.

PUBLIC HEALTH POLICIES

Health Administrators.—The health administrator does not need to be reminded of the public health implications of Vincent's infection, since the protection of community health is part of his job. But reference to methods of prevention which have been followed in various localities should be of value.

So many cases have been traced to the use of unclean glasses in public eating and drinking places that drastic action to enforce sterilization has been found necessary in several instances. While most states have laws which require sterilization of drinking vessels or the use of single-service cups, in every community there are some proprietors who ignore these laws. The danger of the unclean cup or glass may exist in restaurants, soda fountains, cafeterias, roadside stands, ice cream parlors, hotels, taverns, roadhouses, at wayside carts or any establishment where food and drink is served to the public.

During the epidemic of trench mouth in Hagerstown, Md., above referred to, the city health authorities conducted a careful inspection of such establishments to discover whether they were complying with the sanitary statutes. Larger places were found to be cleansing glasses properly, but proprietors of several smaller shops had to be warned to take precautions.

Last January, the health commissioner of Syracuse, N. Y., called for public aid in the enforcement of sanitary conditions

33. Accepted Dental Remedies, Council on Dental Therapeutics, J.A.D.A., 22:1225 (July) 1935.

in local restaurants because cases in other towns had developed from this condition. Restaurant patrons who were served with unclean dishes or glasses were asked to report such conditions to the health department.

The Battle Creek, Mich., epidemic of last fall, previously mentioned, caused the health department to institute the drafting of a city ordinance which requires a chlorine rinse for all glassware used in public places, particularly in beer gardens. The city chemist makes a statement to the local press that the ordinance will not prevent infection until it includes silverware and dishes as well.

In addition to sterilization by chemical disinfection, three other methods of insuring germ-proof drinking receptacles are provided by various state and municipal laws: the use of boiling water or steam under pressure and the use of paper cups which are discarded after one service.

Where a dishwashing machine is installed and regularly used, dishes, glasses and silverware are kept long enough in steam or boiling water to kill pathogenic germs and insure safe service for every patron.

Thorough cleansing by hand, followed by adequate rinsing or immersion in boiling water, also destroys the germs, but the human element involved in the process sometimes proves an obstacle to satisfactory performance. Difficulties of this nature have resulted in legislation in some communities forbidding the use of glasses all together. In Asbury Park, N. J., the serving of beverages and ice cream must be provided "in paper or other suitable cups or vessels that shall be used but once and then be destroyed or discarded." Obviously, since a paper cup reaches a customer direct from a sterile package or dispensing machine, it offers a foolproof method of providing clean service. A fact not realized by the general public is that anyone who doubts the cleanliness of a glass has a legal right to demand a single-service receptacle.

Legislation has routed the common drinking cup from most public drinking fountains, replacing it with paper cups, yet this health menace still exists in some quarters.

Regarding its dangers, Prescott and Horwood,[34] in their revision of "Sedgwick's Principles of Sanitary Science and Public Health," state:

> The march of sanitary progress has brought home clearly the grave dangers that lurk in the use of the common drinking cup. The various pathogenic microbes that are found in the saliva and sputum, especially those responsible for the so-called respiratory diseases, may be transmitted from person to person in this way. . . . The common drinking cup, wherever found, must be regarded as a sanitary abomination and should not be tolerated any longer.

It is noteworthy that precautions needed to prevent the transmission of Vincent's infection are the same as those necessary for protection from other communicable diseases. For instance, the following warning against tuberculosis infection given by Prescott and Horwood[35] applies just as forcibly to avoidance of the disease that we are discussing:

> Kissing, droplet infection, fresh and frequent infection through the use of hands, the common glass or drinking cup, the promiscuous use of eating utensils without proper sterilization in families where an active case of tuberculosis exists, the improper disposal of tuberculous sputum, the common use of handkerchiefs or towels infected with tubercle bacilli, spitting, the improper protection of the tuberculous cough,

34. Prescott, S. C., and Horwood, M. P.: Sedgwick's Principles of Sanitary Science and Public Health, New York City: The Macmillan Company, 1935, p. 73.

35. Footnote 34, p. 492.

loud speaking, sneezing, moistening the fingers to turn the pages of a book or to distribute transfer tickets, the licking and subsequent application of postage stamps to envelopes, these are some of the methods by which infectious materials in the saliva and sputum are transmitted by contact. True, the germs of disease do not live very long in the environment, but the tubercle bacillus is a hardy pathogen, and even if some die, a fresh supply may soon replace them.

Health departments are offering to dentists and physicians facilities for culture and smear diagnoses. As explained under the subheads of diagnosis and treatment, this service is of inestimable value, especially for patients who can ill afford to pay for laboratory examinations.

Many authorities believe that designating Vincent's infection as a reportable disease in all states would minimize the possibility of passing it on from the affected to the well. This would be particularly true in schools, offices, factories and other places where large numbers of persons congregate. If health officials deem compulsory action infeasible, dentists and physicians might be requested to report promptly the trench mouth cases found among their patients. It is thought that designating the disease as reportable would enable authorities to estimate more accurately the prevalence of Vincent's infection. Also, officials would be aware of impending epidemics, and opportunities would be at hand to trace the sources of the infection more readily.

Educational programs advising the public concerning the nature, danger and avoidance of the disease should be promulgated. Boards of health would find it worth while to provide dentists and physicians with instructive leaflets which they could distribute to patients.

School Administrators.—Those in control of school health programs should take the following precautions:

1. Provide a healthful variety of foods, properly cooked, in school cafeterias.
2. Establish a sterilization process for all eating and drinking utensils used in school cafeterias and install paper cups where there is any doubt about thoroughness of cleansing.
3. Exclude children affected with Vincent's infection.
4. Provide paper towels.
5. See that drinking fountains are so constructed that children's lips cannot touch the water spout.
6. Teach children to keep their fingers out of their mouths.
7. Teach children to refrain from putting food in their mouths that has been in another's mouth.
8. Teach children proper mouth hygiene practices.
9. Teach children the importance of frequent and regular dental care.

Duties of Dentists.—The duties of dentists may be listed as follows:

1. To inform all patients affected with the disease of their responsibility in avoiding passing on the disease to others.
2. To cooperate with the health departments and the schools in the prevention of Vincent's infection.
3. To present the information necessary to enable health and school administrators to carry on educational programs.
4. To make certain that patients continue treatments until the disease is cured.
5. To give necessary treatment in accordance with authoritative teaching.
6. To refer to physicians such cases as show systemic symptoms.

Duties of Physicians.—The duties of physicians may be listed as follows:

1. To cooperate with dentists when cases show oral involvements.
2. To treat cases showing systemic involvements.

3. To cooperate with the health department in treating active cases.

4. To make certain patients continue treatment until the disease is cured.

5. To cooperate with the health department and schools in a preventive educational program.

CONCLUSION

With concerted action on the part of all these groups, the coming year should show a wider knowledge of all factors in Vincent's infection and a decided lessening in the development of cases throughout the entire country.

DOROTHY DOT AND DOROTHY DOD

When Dorothy Dod
Was about a year old
She was beautiful too
Or so I've been told.

But Dorothy Dod
Though a sweet little miss
Had a terrible habit
She couldn't resist
Her terrible habit
Looked something like this.

ONCE upon a time, there were two little girls
Alike as two peas in a pod
And one little girl was Dorothy Dot
And one was Dorothy Dod.

Now Dorothy Dot
Was a sweet little miss
Her mouth was a rose bud
Just made to kiss
and Dorothy Dot
Looked something like this.

Both little girls
They grew and they grew
Bigger and bigger
As little girls do.

When Dorothy Dot
Was twelve or fourteen
She was the prettiest child
That I've ever seen
Her features were those
Of the loveliest queen.

And everyone says
(and I think you'll agree)

That Dorothy Dot
Is as smart as can be.

Her eyes shine like diamonds
She's alert all the while
It's really a pleasure
To see Dorothy smile
The merriest, fairest
Kind of a smile.

But Dorothy Dod
It's sad to relate
Has suffered a terrible
Terrible fate.

As she grew and she grew
So did her habit
'Till her poor little face
Looked just like a rabbit.
A frowsy, drowsy
Shy little rabbit.

Her teeth were pushed outward
Her jaw was pushed in
She lost all her beauty
And also her chin.

Her eyes lost their luster
Which makes her look dumb
She hasn't a playmate
Not even a chum
All on account of her
Sucking her thumb.

Let this be a lesson
To all those that have it
This terrible, treacherous
Thumb-sucking habit.

Historic dueling oaks in city park, New Orleans.

DENTAL ECONOMICS

SOCIAL SECURITY

THE Social Security bill, passed by the United States Senate August 9 and signed by President Roosevelt August 14, is a landmark in social legislation in the United States. Its passage marks a new social order. While its immediate effect will probably not be of noticeable consequence, it will eventually change the whole pattern of American life.

In Mr. Roosevelt's opinion, it is a "cornerstone in a structure which is being built but is by no means complete." He states that "it will give some measure of protection to 30,000,000 of our citizens, but it cannot give complete insurance against the hazards and vicissitudes of life."

The new law does several different things. First, it sets up a long-range old age pension system to be financed by an income tax on employes and a payroll tax on employers.

Secondly, it provides federal-state unemployment compensation. This is based on a payroll tax of employers. It will be paid to workers during unemployment, according to rules adopted by the several states.

Thirdly, it provides immediate aid to the states in their care of unemployables, including mothers, crippled children, dependent children, needy old people, the disabled and the blind.

The Economic Security Committee has estimated that there are at least 2,400,000 persons over 65 years of age who are in need. How many of these will receive immediate assistance depends almost wholly on the action by the states to meet their share of the pension costs.

The federal government will match state pension payments up to $15 per person a month. The individual states can increase their share of the pension payments if they like.

Pensions are to be paid to any eligible person who has been resident in the state of application during the preceding year and who has lived in that state at least five of the previous nine years. Until 1940, states may refuse pensions to persons less than 70 years old, but, after that date, pensions must be paid to those destitute who are 65 years or older.

At present, there are about thirty-one states with old-age pension laws on their books. The majority of these laws will have to be changed to conform with the standards laid down by the federal law.

Where constitutional limitations prevent the immediate establishment of old-age pension systems, as in the case of Georgia, the federal government will cooperate with the cities and counties to the extent of half their pension payments until state systems can be established.

OLD-AGE ANNUITIES

The section of the law referring to old-age annuities applies to workers who reach the age of 65 and who, with their employers, have made joint contributions to an "old-age fund."

Starting Jan. 1, 1937, workers will pay a 1 per cent tax on their earnings, which will gradually be increased to 3 per cent in 1949. Employers also will pay a similar tax on their payrolls. From the proceeds of these taxes, persons who have been paying the taxes for five years and who are over 65 and out of work will receive pensions, beginning in 1942, direct from the government.

Farm laborers, domestic servants, government employes and casual laborers are to be excluded from this system.

Before benefit payments will be made, the worker must have retired and have received a total of $2,000 in wages. The accompanying table illustrates the monthly payments to be received after certain periods of employment.

MONTHLY PAYMENTS AS BASED ON PERIOD OF EMPLOYMENT

Average Monthly Salary	Years of Employment 10	20	30	40
	Compensation			
$50	$17.50	$22.50	$27.50	$32.50
100	22.50	32.50	42.50	51.25
150	27.50	42.50	53.75	61.25
200	32.50	51.25	61.25	71.25
250	37.50	56.25	68.75	81.25

AID FOR JOBLESS

Unemployment Insurance.—The law provides for a cooperative federal-state system in which the federal government will make it possible for the states to enact unemployment compensation laws through levying a uniform tax on employers, measured by their payrolls, against which a credit will be allowed for payments made under state unemployment compensation laws.

The actual administration will be vested in the states. Aside from a few restrictions to insure efficient administration and use of all funds collected for the payments of benefits to unemployed workmen, the states will be free to determine for themselves the type of law they prefer, the length of waiting periods, the duration of benefits and all other features of the legislation.

Officials of the Economic Security Committee say that it may be at least two and one-half years before unemployment compensation will be made available to workers in most states. Wisconsin, which has already a law in operation, will, they say, probably be the first state to pay out unemployment benefits.

Two state unemployment compensation laws now in effect give some indication of the benefits unemployed workers may receive: New York provides that after a three weeks' waiting period, an unemployed worker will receive insurance benefits up to $15 a week for a maximum period of sixteen weeks. Wisconsin provides that unemployed workers receive a maximum of $10 for ten weeks.

PENSIONS FOR THE BLIND

Federal contributions for pensions for the blind are available on the same conditions as those to be granted to the aged now in need. The federal government will match state payments on a 50-50 basis, except that in no case will the government pay more than $15 per person a month. The sooner the states enact cooperating laws, the more quickly will these pensions be granted.

In the case of maternal and child welfare services, the average citizen who qualifies for aid will receive no cash benefits, but free medical service and welfare supervision. In the case of the millions made available to the states for better public health service, the citizens will benefit through enlarged health services and more adequate health protection.

Under the Social Security Act, an annual federal appropriation of $8,000 is authorized for allotment by the Surgeon General of the U. S. Public Health Service with the approval of the Secretary of

the Treasury to states and other political subdivisions to aid in their public health programs. In addition to this, an annual appropriation of $2,000,000 is authorized to cover the pay, allowances and expenses of the Public Health Service personnel who are assigned to assist the different states in their health program.

The bill authorizes the expenditure of $24,750,000 this year, to be paid to dependent children; also, such amounts as may be needed in future years.

Expenditure of $3,800,000 annually is authorized by the Secretary of Labor to assist states in promoting the health of mothers and children.

Expenditure of $2,850,000 annually is authorized by the Secretary of Labor to help states extend and improve their services and care of crippled children.

Expenditure of $3,000,000 annually is authorized to aid states to furnish financial assistance to needy permanently blind persons.

All told, the social security program called for an appropriation this year of $76,000,000. Funds were to have been supplied by the supplemental appropriation bill of $102,000,000. The supplemental bill was killed just before the adjournment of the seventy-fourth session of Congress, August 26, by the now historic five and a half hour filibuster of the late Senator Huey Long. This leaves the social security program temporarily without finances with which to function.

The administration is proceeding to set up a skeleton staff with orders to establish the necessary machinery for projecting the Social Security Program, once the money is obtained. Among other things, this staff is to check state laws to see that they conform with federal standards. In the event that they do not, plans are to be drafted for legislatures to act on. In the event the various state governors call special sessions in the near future, $10,000,000 from the work relief fund is to be used in gathering the necessary statistical information.

The administration hopes that early in the 1936 session of Congress, the necessary funds to finance the program will be appropriated.

For the purpose of further and better coordination of federal government health activities, in view of the many health provisions contained in the security act, the President created an interdepartmental committee composed of Josephine Roche, Assistant Secretary of the Treasury; Oscar Chapman, Assistant Secretary of the Interior; M. L. Wilson, Assistant Secretary of Agriculture, and A. J. Altmeyer, Second Assistant Labor Secretary.

"I am directing this committee to include within the scope of its work not only health activities, but closely related welfare activities," Mr. Roosevelt said. It is expected that eventually a complete coordination of the government's activities in the health field will be brought about.

REPORT OF A.D.A. OFFICIALS ON COMPULSORY HEALTH INSURANCE SYSTEMS IN EUROPE

Frank M. Casto, President, George B. Winter, President Elect, and Arthur C. Wherry, Past President, of the American Dental Association recently returned from Europe on the Steamship Washington, where they investigated the practice of dentistry under compulsory health insurance systems.

Dr. Casto, speaking of the practice of dentistry on the continent and the British Isles, states:

The comparatively few dentists who are engaged in private practice exclusively and those who do but a small percentage of insurance practice are using approved scientific methods in diagnosis and treatment. . . .

My observation of dental practice outside of those practices mentioned in the foregoing groups and which comprises by far the majority was most disappointing. . . . It was almost invariably true that the larger the percentage of insurance practice engaged in, the lower the standards maintained and the poorer the quality of service rendered. The service in these cases was almost entirely confined to plastic fillings, particularly amalgam fillings and vulcanite dentures. The equipment of this group was inadequate, of inferior quality and of antique vintage. . . .

Drs. Wherry, Winter and Casto on board ship.

The most vivid impression I have of dentistry in the European countries visited is a living, walking, glaring monument of false teeth. . . . As far as I could learn, there is practically no program for public dental health education and little effort made to promote preventive methods. . . .

One noteworthy thing that may be mentioned is that all unethical advertising is prohibited by law. This, to say the least, is a most happy and commendable situation. . . .

It may be said in fairness that all dentistry is not below the standard of American dentistry, but it is quite certain that dentistry under the present insurance plan is a demoralizing and degenerative process and I can see no hope of improvement, either in the type and quality of service or in the advancement of the profession as long as this plan is in effect.

Dr. Winter, President Elect, states:

Last year and again on a recent trip, I made quite a study of the system in England, and found that their plan is not suitable to our practitioners or patients. Our economic committee is facing a very difficult problem. It is up to them to formulate a plan that will be just, yet suitable to our American practitioners and patients. I believe that they must proceed on a new line and develop something original and different.

Past President Wherry expresses his opinion thus:

I have the highest regard for the intelligence, professional attainment and ethical practices of the men practicing dentistry independently in the various European countries that I traveled in, but unfortunately they are a small percentage of the membership of the profession. . . .

My observations convinced me that the great majority of the poorer classes of the European countries are, in many instances, receiving dental service that is worthless because it does not attempt to provide anything but emergency relief and the cheaper class of restorative service. In no country did we find evidence of panel dentistry or government supervised dentistry delivering to the poor people a service anywhere comparable with the type of dentistry that has been furnished—many times free of cost—

to the poor in this country. In addition, the manner in which a machinery has been built up to handle the administrative features of supervised professional service is the most discouraging feature of the whole system and it should bring the men of the medical and dental professions in America to realize the hazard of such a system and the demoralizing influence it would have should it ever be injected into our own situation. . . .

In my opinion, this subject of all important subjects is the least appreciated by the men of our profession in this country. It has been misrepresented by men with distorted viewpoints and possible mercenary motives. It will be my aim during the months to come to give my utmost to visualize to the men of our profession the falseness of this whole system, and its worthlessness.

The subject of compulsory health insurance dentistry as it is practiced in European countries will be discussed in more detail by these three officials of the American Dental Association at the New Orleans Meeting in November.

DENTAL SERVICES UNDER DENMARK'S HEALTH INSURANCE SYSTEM

Following is an excerpt from a letter received from the Legation of the United States of America, Copenhagen, Denmark, under date of July 25, 1935, and signed by Hon. Ruth Bryan Owen, American Minister:

"Regarding your inquiry as to the operation of dental services under Denmark's health insurance system, I may tell you that these services are supplied under the new Social Reform Bill to 'active' members of the authorized sick clubs, of which all persons over 21 years of age must be members, either 'participating' or 'inactive,' at considerably reduced prices, to be paid by the patient, in addition to the contribution made by the sick clubs, at the completion of the work. Dental service is based on a special arrangement made between the sick clubs and a certain number of dentists, which is subject to the approval of the Minister of Social Affairs."

4-H CLUB "PROTECT YOUR SMILE" PROGRAM*

There is in the United States a club of about 1,000,000 boys and girls from 10 to 20 years of age. They come mostly from the rural sections of every state, and are banded together in small groups in the various districts. All are branches of the National 4-H Club. Their purpose is self-improvement as to "Head, Hand, Heart and Health," and this they attempt through educational programs conducted by the local club leaders. The Massachusetts branch has a membership of 20,000.

Through the cooperation of the Massachusetts Dental Society, with the Department of Public Health and the Massachusetts State College, a plan has been arranged whereby all of these 20,000 boys and girls, participating in a "Protect Your Smile" program as part of their general health program, are receiving through the Massachusetts Department of Public Health instruction regarding diet and home care for the development and preservation of mouth health.

All Massachusetts dentists practicing in districts adjacent to 4-H Clubs have been given an opportunity to participate in the program by examining the mouths of all 4-H members and offering suggestions for their personal care and improvement in their mouth conditions. About 600 dentists are cooperating and are now in the process of consulting with the members as they are brought to the dental offices.

The purpose of the Massachusetts Dental Society was twofold: (1) a desire to have

*Extracts from a report prepared by Maurice Peters, Boston, Mass., and read before the New England state societies, 1935.

dentistry do its part in a health program for young people of the state, and (2) for our own benefit in having 20,000 new potential patients brought to the offices of dentists to receive dentistry's cooperation and advice and its message of health and helpfulness to take home to at least four times 20,000 people needing dentistry's aid, and able to pay something for it.

The idea, apparently, was originated by Mrs. McCarthy, consultant in dental hygiene of the Massachusetts Department of Public Health and while Massachusetts is the first state to carry out such a program, I feel it has wonderful opportunities for dentists of other states and should be promoted by them. I commend it to the officers of your societies.

BEST TYPE OF OLD AGE PENSION

After the economic and industrial debacle of the past few years people are more interested in security than they are in profits. So many have seen the savings of a lifetime swept away by the depression tidal wave and they are asking if there is any investment that is really secure.

As one looks over the field of securities there are no institutions that have weathered the storms so well as have the life insurance companies. A few of the smaller ones have fallen by the wayside, but the majority of them have stood like a mighty rock against which the tides of depression have beaten fiercely, and unsuccessfully through all kinds of financial weather.

Not only have they been able to carry on at the same old stand and in the same old way, but they have been a life saver for many corporations and individuals who otherwise would have gone down.

The government is giving special attention at this time to various forms of social security legislation. This is but giving government sanction to the work which these life insurance companies have been doing for many decades.

Many a man today who finds himself financially flat or loaded up with many securities of little value can wish that he had, in his younger days, started to build up an estate through some of the substantial policies offered by the life insurance companies. Those who did so have come through these hard times with ample provision for the "rainy day" and have little worry.

A substantial life insurance policy provides double-barrelled security. It will take care of the folks if anything "happens," and if it doesn't happen, the insured can look forward to old age, assured of a happy sunset, as far as financial matters are concerned.

A life insurance policy is a good anchor to have aboard whether the sailing ahead is good or rough. It provides the best type of old age pension.—*Marietta (Ohio) Times*, Aug. 5, 1935.

PRESS RELEASE SERVICE NOW AVAILABLE TO MEMBERS

For the past several months, the Committee on Economics of the American Dental Association has issued timely press notices on current economic and other subjects to the state and component society editors.

Congratulatory letters from the editors indicate that the releases are most worthwhile. Believing that other members of the Association might wish to take advantage of this service, we are offering a one year's subscription to this service for $1. The committee issues approximately ten releases each month.

Send your subscription with $1 to the Secretary of the Committee on Economics, American Dental Association, 212 E. Superior St., Chicago, Ill.

AMERICAN DENTAL ASSOCIATION SEVENTY-SEVENTH ANNUAL SESSION

NEW ORLEANS, LA., NOV. 4, 5, 6, 7, 8, 1935

OFFICIAL CALL

To the Members of the American Dental Association:

You are hereby notified that the Seventy-Seventh Annual Session of the American Dental Association will be held in New Orleans, La., Nov. 4-8, 1935.

The House of Delegates will convene at 10:00 a.m., Monday, November 4; the second meeting will be held at 2:30 p.m., Monday, November 4; the third meeting at 2:30 p.m., Wednesday, November 6, and the fourth meeting at 2:30 p.m., Thursday, November 7. The four meetings of the House of Delegates will be held in the Roosevelt Hotel. The Credentials Committee will register Delegates and Alternates, beginning at 10:00 a.m., Sunday, November 3, at the Roosevelt Hotel.

All other members will register at the Registration Office in the Municipal Auditorium. The Registration Department will be open from 9:00 a.m. to 5:00 p.m., Sunday, November 3, and from 8:30 a.m. to 5:00 p.m., Monday, Tuesday, Wednesday, Thursday and Friday, November 4, 5, 6, 7, 8.

The General Meeting which constitutes the opening exercises of the Session will be held Tuesday, November 5, at 9:30 a.m. The second and third General Meetings will be held on Tuesday and Wednesday, November 5 and 6, at 7:45 p.m. The three General Meetings will be held in the Auditorium.

The constituent societies are hereby notified to file with the Secretary of this Association at least thirty (30) days prior to the first day of said Annual Session a list of the names and addresses of their Delegates and Alternates.

FRANK M. CASTO, *President,*
HARRY B. PINNEY, *Secretary.*

GENERAL PROGRAM

Registration (General).....Sunday, November 3, 9:00 a.m.
(New Orleans Auditorium)

Registration (Delegates and Alternates).....Sunday, November 3, 10:00 a.m.
(Roosevelt Hotel)

Board of Trustees (First Meeting).....Friday, November 1, 10:00 a.m.
(Roosevelt Hotel)

Board of Trustees (Second Meeting).....Saturday, November 2, 10:00 a.m.
(Roosevelt Hotel)

House of Delegates (First Meeting).....Monday, November 4, 10:00 a.m.
(Roosevelt Hotel)

House of Delegates (Second Meeting).....Monday, November 4, 2:30 p.m.
(Roosevelt Hotel)

House of Delegates (Third Meeting).....Wednesday, November 6, 2:30 p.m.
(Roosevelt Hotel)

House of Delegates (Fourth Meeting).....Thursday, November 7, 2:30 p.m.
(Roosevelt Hotel)

PRELIMINARY PROGRAM FOR NEW ORLEANS SESSION

FIRST GENERAL MEETING
(Auditorium)

TUESDAY, NOVEMBER 5

9:30 a.m. Music (Orchestra)

10:00 Invocation
Archbishop Joseph Francis Rummel.....New Orleans, La.

10:05 Music (Orchestra)

10:15 Greetings from the City of New Orleans
Mayor T. Semmes Walmsley.....New Orleans, La.

10:30 Greetings from the Local Arrangements Committee
Fred J. Wolfe, General Chairman.....New Orleans, La.

10:45 Address of Welcome from the First and Second District Dental Society
M. B. Varnado, President.....New Orleans, La.

11:00 Address of Welcome from Louisiana State Dental Association
Sidney L. Tiblier, President.....New Orleans, La.

11:15 Response of the American Dental Association
John P. Buckley.....Hollywood, Calif.

11:30 Music (Orchestra)

11:40 President's Address
Frank M. Casto.....Cleveland, Ohio

CHAIRMEN AND SECRETARIES OF THE SCIENTIFIC SECTIONS OF THE AMERICAN DENTAL ASSOCIATION, 1935

SECOND GENERAL MEETING

(Auditorium)

TUESDAY, NOVEMBER 5

7:45 p.m. Music (Orchestra)

8:00 Music
Tulane Glee Club.....New Orleans, La.

8:10 Address: "The Physician Looks at Dental Education"
James M. McLester, M.D.....Birmingham, Ala.

9:10 Address: "Medicine and Social Changes"
R. G. Leland, M.D.....Chicago, Ill.

9:55 Music (Solo)
Miss Elizabeth Wolfe.....New Orleans, La.

THIRD GENERAL MEETING

(Auditorium)

WEDNESDAY, NOVEMBER 6

7:45 p.m. Music (Orchestra)

8:00 Music (Solo)
Mrs. Walter C. Hava.....New Orleans, La.

8:10 Address: "Are the Science and Art of American Dentistry to Be Sacrificed to a False Panacea?"
Arthur C. Wherry.....Salt Lake City, Utah

8:55 Music (Solo)
Mr. Frank Senasci.....New Orleans, La.

9:10 Address

9:15 Music (Duet)
Mrs. Walter C. Hava.....New Orleans, La.
Mr. Frank Senasci.....New Orleans, La.

FOURTH GENERAL MEETING

(Hotel Roosevelt)

THURSDAY, NOVEMBER 7

8:30 p.m. Supper Dance (Formal)
In honor of retiring President, Frank M. Casto.

THE SCIENTIFIC SECTIONS

TUESDAY, NOVEMBER 5

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Auditorium)

OFFICERS OF SECTION

E. Bruce Clark, Chairman...Uniontown, Pa.
Ralph R. Byrnes, Vice Chairman.....Atlanta, Ga.
Paul K. Hill, Secretary.....Tucson, Ariz.

2:30 to 5:00 p.m.

"Basic Requirements for Management of Gold Foil"
By H. E. Latcham.....Baltimore, Md.

Napoleon House, built more than 100 years ago and intended as a refuge for Emperor Napoleon.

Discussed by
W. I. Ferrier.....Seattle, Wash.
James Mark Prime.....Omaha, Nebr.

"The Porcelain Inlay by the Direct Method"
By Nye W. Goodman.Los Angeles, Calif.

Discussed by
A. L. Le Gro.....Detroit, Mich.
S. M. Weaver.....Cleveland, Ohio

"The Gold Inlay"
By Norman H. Denner..Cleveland, Ohio

Discussed by
William A. Garrett.....Atlanta, Ga.

FULL DENTURE PROSTHESIS

(Auditorium)

OFFICERS OF SECTION

Harold L. Harris, Chairman..St. Paul, Minn.
W. H. Wright, Vice Chairman.....Wilkinsburg, Pa.
Walter J. Pryor, Secretary..Cleveland, Ohio

2:30 to 5:00 p.m.

"Esthetic Factors Which Must Be Considered to Secure the Maximum in Full Restorations"
By Earl L. Richey.....Chicago, Ill.

"Aluminum, the Superior Metal Base"
By Dayton Dunbar Campbell.....Kansas City, Mo.

"Functional Impressions for Releasing Full Dentures"
By Victor H. Sears.....New York City

PARTIAL DENTURE PROSTHESIS

(Auditorium)

OFFICERS OF SECTION

H. E. King, Chairman.....Omaha, Nebr.
Glee Tarbell, Vice Chairman.....Watertown, S. D.
Paul A. Edmand, Secretary.....Chicago, Ill.

2:30 to 5:00 p.m.

"Alveolar Surgery, Removing Sufficient Hard and Soft Tissue to Allow Insertion of Bridges, in Close Bite Cases"
By S. Marshall Weaver..Cleveland, Ohio

"Anatomy of the Temporomandibular Articulation—Its Importance to the Dentist" (Lantern Slides)
By C. A. DeVere.....New York City

"Fundamentals of Partial Denture Design"
By R. W. Tench.....New York City

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Auditorium)

OFFICERS OF SECTION

Harry Bear, Chairman.....Richmond, Va.
E. W. Browning, Vice Chairman.....Salt Lake City, Utah
Howard C. Miller, Secretary....Chicago, Ill.

2:30 to 5:00 p.m.

"The Relation of Dental to Medical Hospital Service"
By Leonard S. Morvay....Newark, N. J.

"Malignant Tumors of the Oral Cavity"
By Carroll W. Stuart.....Chicago, Ill.
"The Responsibilities of the Dentist in Reference to the Cardiac Patient"
By H. N. Boyne (M.D.)..Omaha, Nebr.

ORTHODONTIA
(Auditorium)
OFFICERS OF SECTION
O. W. Brandhorst, Chairman..St. Louis, Mo.
Joseph E. Johnson, Vice Chairman.....
.....Louisville, Ky.
Richard Lowy, Secretary.....Newark, N. J.
2:30 to 5:00 p.m.
"Medical Background of the Orthodontic Patient"
By Harold J. Noyes.....Chicago, Ill.
"Practical Relation of Orthodontia to Other Fields of Dentistry"
By George R. Moore..Ann Arbor, Mich.
"Coordinating Treatment with Diagnosis"
By Joseph H. Williams....St. Louis, Mo.

PERIODONTIA
(Auditorium)
OFFICERS OF SECTION
Grace Rogers Spalding, Chairman.....
.....Birmingham, Mich.
Walter Leabo, Vice Chairman.....
.....Shreveport, La.
Raymond E. Johnson, Secretary.....
.....St. Paul, Minn.
2:30 to 5:00 p.m.
"Safeguarding the Foundation"
By C. N. Johnson.....Chicago, Ill.
"Home Care of the Interproximal Spaces"
By Clayton H. Gracey....Detroit, Mich.
"Evaluation of Periodontia in the Dental Curriculum"
By Celia Rich.....Nashville, Tenn.

CHILDREN'S DENTISTRY AND ORAL HYGIENE
(Auditorium)
OFFICERS OF SECTION
Ernest A. Branch, Chairman..Raleigh, N. C.
Charles A. Sweet, Vice Chairman.....
.....Oakland, Calif.
R. C. Leonard, Secretary.....Baltimore, Md.
Paper
By Kenneth R. Gibson....Detroit, Mich.
"Teaching Dental Health by Visual Education"
By Miss Anne B. Towse....Chicago, Ill.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)
(Auditorium)
OFFICERS OF SECTION
Rufus W. Leigh, Chairman.....
.....Fort Hancock, N. J.
Rudolf Kronfeld, Vice Chairman.....
.....Chicago, Ill.
Paul C. Kitchin, Secretary..Columbus, Ohio
2:30 to 5:00 p.m.
"Biologic Factors in Dental Disorders"
By Samuel Rabkin.....Cincinnati, Ohio
"Innervation of the Teeth"
By Alton D. Brashear....Rochester, N. Y.
"Surgical Anatomy of the Pterygomandibular Space"
By Hugh W. MacMillan Cincinnati, Ohio
"Supplemental Résumé of the Research Activities of Organized Dentistry, Listing Published Reports and Papers"
By Homer C. Brown....Columbus, Ohio
"Field Studies Among Some African Tribes on the Relation of Their Nutrition to the Incidence of Dental Caries and Dental Arch Deformities"
By Weston A. Price....Cleveland, Ohio

WEDNESDAY, NOVEMBER 6

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS
(Auditorium)
9:30 a.m. to 12:00 m.
"Recent Advances in the Knowledge of Drugs and Their Application in Modern Dental Health Service"
By W. H. O. McGehee.....
.....Washington, D. C.
Discussed by
R. S. Vinsant.....Memphis, Tenn.
G. D. Timmons.....Indianapolis, Ind.
"Diet in Preventive Dentistry"
By Clifford J. Barborka (M.D.).....
.....Chicago, Ill.
"Additional Studies in the Clinical Application of Available Local Anesthetics"
By Ralph C. Cooley.....Houston, Texas

FULL DENTURE PROSTHESIS
(Auditorium)
9:30 a.m. to 12:00 m.
"Research on the Biologic Phases in the Retention of Artificial Dentures"
By E. C. Pendleton.....Chicago, Ill.

"The Taking of Registrations for Securing Centric Jaw Relation"
By F. M. Hight.....Houston, Texas

"New Curved Cusp Posterior Teeth"
By H. F. McGrane.....Omaha, Nebr.

PARTIAL DENTURE PROSTHESIS

(Auditorium)

9:30 a.m. to 12:00 m.

"The Partial Denture as a Vehicle for Function"
By D. W. McLean....Los Angeles, Calif.

"Partial Denture Design"
By F. G. Neurohr.....New York City

"Porcelains and Their Application"
By Fred R. Felcher.....Chicago, Ill.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Auditorium)

9:30 a.m. to 12:00 m.

"Gas-Oxygen Anesthesia for the Dentist"
(Illustrated by motion pictures)
By Harry M. Seldin.....New York City

"What Should a Physician Know About Dentistry?"
By E. V. Allen (M.D.)..Rochester, Minn.
Boyd S. Gardner....Rochester, Minn.

"Essentials of Radiodontic Service"
By Clarence O. Simpson..St. Louis, Mo.

ORTHODONTIA

(Auditorium)

9:30 a.m. to 12:00 m.

"Relation of Respiration to Malocclusion"
By Leland R. Johnson.....Chicago, Ill.

"Ectopic Eruptions of Permanent Teeth as Factors in Premature Loss of Certain Deciduous Teeth"
By Samuel J. Lewis.....Detroit, Mich.

"Functional Space Maintenance: Has it a Place in Dentistry for Children?"
By C. S. Foster.....Cedar Rapids, Iowa

PERIODONTIA

(Auditorium)

9:30 a.m. to 12:00 m.

"Excessive Occlusal Stress in Relation to Periodontal Lesions"
By Edgar D. Coolidge.....Chicago, Ill.

"Vincent's Infection"
Daniel R. Clark.....Minneapolis, Minn.

"Record Keeping as an Asset to Practice"
O. W. Brandhorst.....St. Louis, Mo.

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Auditorium)

9:30 a.m. to 12:00 m.

"Eighteen Years of Mouth Health Teaching"
By George Marion Cooper (M.D.)...
.....Raleigh, N. C.

"Rôle of Fusospirochetal Organisms in Acute and Chronic Infections of the Mouth"
By David T. Smith (M.D.).....
.....Durham, N. C.

Street scene in Vieux Carre.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Auditorium)

9:30 a.m. to 12:00 m.

"A Definite and Dependable Therapy for Pulpless Teeth"
By Alfred Walker.....New York City

"New Relation of Dietary Conditions to Mottled Enamel"
By Margaret C. Smith.....Tucson, Ariz.

"Question of Enamel and Dentin Metabolism"
By Theodore Beust.....Louisville, Ky.
"Daily Rhythm in the Formation and Calcification of Enamel and Dentin"
By Isaac Schour.....Chicago, Ill.
"Median Anterior Maxillary Cysts"
By Edward C. Stafne...Rochester, Minn.

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Auditorium)

2:30 to 5:00 p.m.

"Pulpectomy and Partial Pulpectomy"
By W. Clyde Davis.....Lincoln, Nebr.
"Preliminary Report on Silicate Cements"
By George C. Paffenbarger.....
.....Washington, D. C.
Ira C. Schoonover....Washington, D. C.
"Civilization a Disease"
By Peter J. Brekhus..Minneapolis, Minn.
Discussed by
Thaddeus P. Hyatt.....Brooklyn, N. Y.
Charles F. Bödecker.....New York City

FULL DENTURE PROSTHESIS

(Auditorium)

2:30 to 5:00 p.m.

"Retention and Stability for Full Dentures"
By Wilfred H. Terrell..Pasadena, Calif.
"Immediate Denture Technic"
By Bert L. Hooper.....Lincoln, Nebr.
"Some Physical Properties of Denture Materials"
By W. T. Sweeney....Washington, D. C.

PARTIAL DENTURE PROSTHESIS

(Auditorium)

2:30 to 5:00 p.m.

"Something New on Cusps and Sulci Analysis, Balanced and Functional Occlusion and Stress Breakers"
By F. S. Meyer.....Minneapolis, Minn.
"Testing of Certified Dental Materials"
By William Souder...Washington, D.C.
John R. Beall.....Washington, D. C.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Auditorium)

2:30 to 5:00 p.m.

"Surgical Technic of the Soft Tissues for the Removal of Impacted and Hypercementosed Teeth"
By J. A. Blue.....Birmingham, Ala.
"Radical Surgery in Malignancy of the Maxilla"
"Relation of Dental Disease to Malignancy of the Maxilla"
By Homer Dupuy (M.D.).....
.....New Orleans, La.
"Impacted Teeth"
By Joseph P. Wahl....New Orleans, La.

ORTHODONTIA

(Auditorium)

2:30 to 5:00 p.m.

"Dentist and Orthodontist"
By John E. Gurley..San Francisco, Calif.
"Vulcanite Plates as an Aid in Prevention and Correction of Minor Malocclusion"
By George S. Callaway..New York City
"Identification by Dental Means"
By Alfred P. Rogers.....Boston, Mass.

PERIODONTIA

(Auditorium)

2:30 to 5:00 p.m.

"Work of the Council on Dental Therapeutics in Relation to Periodontia"
By Samuel M. Gordon.....Chicago, Ill.
"Comparison of Various Methods of Treatment for Periodontal Lesions"
By Willa Yeretsky..Grand Rapids, Mich.
"Periodontal Nomenclature"
By James E. Aiguier...Philadelphia, Pa.

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Auditorium)

2:30 to 5:00 p.m.

"Children's Diet in Relation to Dental Decay"
By H. S. Dwyer.....Brooklyn, N. Y.
Paper
By A. Y. Russell.....Baltimore, Md.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Auditorium)

2:30 to 5:00 p.m.

"Undisturbed and Disturbed Healing of Extraction Wounds in Experimental Animals (Dry Sockets)"
By Roland S. Claflin.....Chicago, Ill.
"Clinical Investigations of Cases of Root Resorption with and Without Orthodontic Therapy"
By Hermann Becks..San Francisco, Calif.

"Practical Application of the Methods of Clinical Medicine in the Diagnosis and Treatment of Oral Dysfunctions"
By James Clarke Healey (M.D.).....Boston, Mass.
Francis H. Daley.....Boston, Mass.
Marion H. Sweet.....Boston, Mass.

"Some Observations on the Relationship of Mercury and Bismuth Medication to Stomatitis"
By Lawrence H. Akers.Hot Springs, Ark.

Courtyard in Vieux Carre, New Orleans.

THURSDAY, NOVEMBER 7

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Auditorium)

9:30 a.m. to 12:00 m.

"Constructing Amalgam Fillings by Reinforcement to Approximate the Strength and Efficiency of Cast Gold"
By Francis A. Bull....Milwaukee, Wis.

"Practical Consideration of the Physical Properties of Some of the Popular Filling Materials"
By George M. Hollenback.....Los Angeles, Calif.

"Use of Laboratory and Systemic Findings in Dentistry"
By Melvin E. Page....Muskegon, Mich.

FULL DENTURE PROSTHESIS

(Auditorium)

9:30 a.m. to 12:00 m.

"Obtaining the Vertical Relation in Edentulous Cases That Existed Prior to Extraction"
By M. E. Niswonger.....Dayton, Ohio

"Simplified Full Denture Construction"
By Frank L. Hart..San Francisco, Calif.

"Revolutionary Mechanical Principle Utilized to Produce Full Lower Dentures Surpassing in Stability the Best Modern Upper Dentures"
By Charles Shepard Tuller.....New Orleans, La.
Sidney C. Fournet...New Orleans, La.

PARTIAL DENTURE PROSTHESIS

(Auditorium)

9:30 a.m. to 12:00 m.

Paper
By Fred H. Hall.....Nashville, Tenn.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Auditorium)

9:30 a.m. to 12:00 m.

"Clinical Oral Pathology" (A lantern slide demonstration)
By Theodor Blum.....New York City

"Diet as a Factor in Healing"
By Frederick F. Molt.....Chicago, Ill.

"Electrical Coagulation in the Management of Pyorrhea"
By G. Farrell Webb....Kansas City, Mo.

ORTHODONTIA

(Auditorium)

9:30 a.m. to 12:00 m.

"Comparative Study of Root Resorption in Permanent Teeth"
By C. E. Rudolph...Minneapolis, Minn.

"Significance of Calcium, Phosphorus and Endocrine Metabolism in Dentistry"
By Charles J. Bloom (M.D.).....New Orleans, La.

"Technic of Orthodontic Appliance Construction, Using Chrome Alloy Metals"
By William R. Humphrey..Denver, Colo.

PERIODONTIA

(Auditorium)

9:30 a.m. to 12:00 m.

"Design of Partial Dentures for Periodontal Cases"
By Edward B. Spalding.....
.....Birmingham, Mich.

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Auditorium)

9:30 a.m. to 12:00 m.

Paper
By N. Talley Ballou.....Richmond, Va.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Auditorium)

9:30 a.m. to 12:00 m.

"Cumulative Research"
By Arthur L. Irons...Washington, D. C.

"Observations on the Relationship of Lactobacilli to Dental Caries in Children During the Experimental Feeding of Candy"
By Philip Jay.....Ann Arbor, Mich.
Faith P. Hadley...Ann Arbor, Mich.
R. W. Bunting....Ann Arbor, Mich.

"New Data on the Chemotherapy of Incipient Caries"
By James Mark Prime....Omaha, Nebr.

"Laboratory Evidence of the Antibiotic Action of Lactobacillus Acidophilus with Proteolytic and Putrefactive Bacteria"
By Don C. Lyons.....Jackson, Mich.

"Relation of Rickets and Vitamin D to the Incidence of Dental Caries, Hypoplasia and Malocclusion in Children"
By D. H. Shelling (M.D.) Baltimore, Md.
George M. Anderson..Baltimore, Md.

"Investigation of Bacterial Flora of Dental Caries"
By Basil B. Bibby.....Rochester, N. Y.
Maynard K. Hine....Rochester, N. Y.

Typical old plantation home near New Orleans.

GENERAL CLINIC PROGRAM

THURSDAY AFTERNOON AND FRIDAY, NOVEMBER 7-8

GROUP 1: COLLEGE CLINICS

Kansas City-Western Dental College

"Removal of Impacted and Malposed Teeth"
Ralph W. Edwards....Kansas City, Mo.

"Fixed Bridges Cast in One Piece"
Walter C. Shull.....Kansas City, Mo.

"Immediate Dentures"
E. L. Dillon.....Kansas City, Mo.

"Occlusion; A Most Important Factor in Full Dentures"
F. Hubert Eversull.....Kansas City, Mo.

"Modification of Porcelain Teeth by Grinding and Staining"
C. G. Porter.....Kansas City, Mo.

College of Physicians and Surgeons of San Francisco

"Combination Gold and Porcelain Veneer Crown"
Sylvan A. Schwartz.San Francisco, Calif.

"Partial Denture Prosthesis"
George A. Selleck...San Francisco, Calif.

Baylor University College of Dentistry

"Improved Gold Casting Technic"
Phillip L. Knutzen.....Dallas, Tex.

"Prosthetics—Cast Partial Dentures"
T. H. Kennedy.....Dallas, Tex.

"Oral Pathology"
W. M. Reppeto.....Dallas, Tex.

GROUP 2: SECTION CLINICS

Operative Dentistry, Materia Medica and Therapeutics

"The Gold Inlay"
Norman H. Denner.....Cleveland, Ohio

"Diagnosis by Laboratory Method"
Melvin E. Page.....Muskegon, Mich.

"Reenforcing Amalgam"
Francis A. Bull.....Milwaukee, Wis.

"Porcelain Inlay by the Direct Method"
Nye W. Goodman....Los Angeles, Calif.

"Bridge Abutments and Pontics"
Ralph C. Cooley.....Houston, Texas

"Pulpectomy and Partial Pulpectomy"
W. Clyde Davis.....Lincoln, Nebr.

Group Clinic: A.D.A. Fellowship of National Bureau of Standards

"Physical Properties of Silicate Cement"
George C. Paffenbarger.....
.....Washington, D. C.

"Standards for Dental Materials"
Wilmer Souder.....Washington, D. C.

"Physical Testing of Denture Materials"
W. T. Sweeney.....Washington, D. C.

"Composition and Solubility of Silicate Cement"
Ira C. Schoonover....Washington, D. C.

"Testing Guaranteed Materials for Compliance with A.D.A. Specifications"
John R. Beall.....Washington, D. C.

Oral Surgery, Exodontia and Anesthesia

"Surgical Technic of the Soft Tissues for the Removal of Impacted and Hypercementosed Teeth"
James A. Blue.....Birmingham, Ala.

"Malignant Tumors"
Carroll W. Stuart.....Chicago, Ill.

"Roentgenographic Interpretation"
Edward C. Stafne.....Rochester, Minn.

Orthodontia

"Photography"
Barney Kennedy.....Jackson, Miss.

"Orthodontic Spring Gage for Intraoral Use"
George R. Moore.....Ann Arbor, Mich.

"Efficient Lingual Appliance for the Mandibular Arch"
Joseph H. Williams.....St. Louis, Mo.

"Vulcanite Plates as an Aid in Prevention and Correction of Minor Malocclusion"
George S. Callaway.....New York City

"Technic of Orthodontic Appliance Construction Using Chrome Alloy Metals"
William R. Humphrey.....Denver, Colo.

"Lateral Expansion to Permit Anterior Teeth to Come In"
D. C. York.....Bryan, Texas

"Importance of Checking the Complement of Teeth and Keeping in Mind the Time of Eruption and Exfoliation of the Teeth"
Leonard F. Pogue.....Nashville, Tenn.

"Oral Disease and Malformations of Early American Indians"
J. Brooks Juett.....Lexington, Ky.

"Twenty-Four Cases of Malocclusion Treated with the Edgewise Arch Mechanism"
Charles H. Tweed.....Phoenix, Ariz.

"Space Retainers"
P. G. Spencer.....Waco, Texas

"Stationary Lingual Loop Appliance"
C. E. Byington.....Chattanooga, Tenn.

"Vulcanite Bite Planes to Be Used with Labial Appliances"
Horace K. Thompson..Wilmington, N. C.

"Chrome Alloy in an Orthodontic Practice"
George H. Herbert.....St. Louis, Mo.

"Guide Planes and Space Maintainers"
Van A. Stilley, Jr.....Paducah, Ky.

"Manipulation and Adjustment of a Cranium Immobilizer in Using Roentgen Rays in Orthodontic Diagnosis"
Ralph Waldron.....Newark, N. J.

"Variations in Lingual Arch Technic"
Harry B. Wright.....Philadelphia, Pa.

"Impacted Teeth"
F. W. Nash.....Scranton, Pa.

"Cast Molar Bands and Cast Cuspid Band Technic over Plastic Models"
Leonard Kohn.....Brooklyn, N. Y.

"Lower Bite Plates for the General Practitioner Treating Class I Division 3 Cases"
Herbert H. Ernst.....New York City

"Relation of High Palate to Respiration"
Leland R. Johnson.....Chicago, Ill.

Periodontia

"Vincent's Infection"
Daniel R. Clark.....Minneapolis, Minn.

"Design of Partial Dentures for Periodontia Cases"
Edward B. Spalding.Birmingham, Mich.

"Record Keeping as an Asset to Practice"
O. W. Brandhorst.....St. Louis, Mo.

Partial Denture Prosthesis

"Advancements in Porcelain Technic"
Fred R. Felcher.....Chicago, Ill.

"Partial Denture Design"
F. G. Neurohr.....New York City

"Anatomy of the Temporomandibular Articulation—Its Importance to the Dentist"
C. A. DeVere.....New York City

"Partial Dentures"
D. W. McLean.....Los Angeles, Calif.

"Root Canal Surgery"
S. Marshall Weaver.....Cleveland, Ohio

GROUP 3: STATE ASSOCIATION INDIVIDUAL CLINICS AND GROUP CLINICS

Alabama

"Amalgam Technic for High Silver Alloy"
C. C. Cannon.....Fayette, Ala.

"Children's Dentistry"
A. B. Horn.....Montgomery, Ala.

"Demonstration of a New Electric Vibrating Instrument for Condensing Amalgam"
O. B. Wright.....Montgomery, Ala.

Southern California

"Illumination and Transillumination" (Motion pictures in color, and slides)
A. Lawrence Dunn.Santa Barbara, Calif.

"The Practical Application of Filling Materials"
George M. Hollenback.....
.....Los Angeles, Calif.

"Applied Preventive Dentistry, Utilizing in a Practical Way Knowledge of Prevention"
Joseph B. Jenkins....Los Angeles, Calif.

"Partial Alveolectomy and Gingival Resection"
Frank S. Kaiser.....Los Angeles, Calif.

"Reconstructive Plastic and Oral Surgery" (Demonstrated by 200 transparent photographs)
Arthur E. Smith.....Los Angeles, Calif.

"Localization of Tissues, Structures, Areas and Objects Beneath the Surface Tissues of the Oral Cavity" (Paper with slides)
Walter S. Thompson..Los Angeles, Calif.

California State

"Mercury Vapor from Silver vs. Copper Amalgams"
John S. Shell.....San Francisco, Calif.

"Some of the Uses of Porcelain in Restorative Dentistry"
J. Raymond Gill....San Francisco, Calif.

"Method of Constructing Crowns and Bridges by Means of Porcelain Fused Directly to the Cast Metal Framework"
Robert C. Zeisz.....San Francisco, Calif.

"Roentgenographic Aspect of Outstanding Lesions of the Jaws"
William B. Ryder...San Francisco, Calif.

Connecticut

"Inlay Technic for the Average Practitioner"
Henry Hicks.....Greenwich, Conn.

"Diagnostic Factors in Chronic Vincent's Infection"
J. Leo Loftus.....Meriden, Conn.

"Dentures—Bite Registrations, Cast Mounting and Set-Up"
Kenneth C. Johnson..New London, Conn.

American Dental Hygienists' Association Group Clinic

District of Columbia

"Mouth Restoration"
Edmond J. Bottazzi...Washington, D. C.

"Raising the Bite by a New Method"
W. S. Benedict.....Washington, D. C.

American Dental Assistants Association Group Clinics:

"Sterilization"
Alabama Dental Assistants Association

"Before and After the Advent of the Dental Assistant"
Little Rock Dental Assistants Study Club

"Models"

"A Library for Dental Assistants"
Long Beach Dental Assistants Association

"Helpful Hints"
Los Angeles Dental Assistants Association

"Modern Dental Office—Equipment and Cost"
Georgia State Dental Assistants Association

"Helpful Hints"
Chicago Dental Assistants Association

"Care of the Handpiece"
Detroit Dental Assistants Society

"Dentistry's Greatest Responsibility"
Minnesota Dental Hygienists and Assistants Association

"Surgical Aids"
St. Louis Dental Assistants Association

"Eating for Teeth"
Nebraska State Dental Assistants Association

"Office Management—The Dental Assistant: Professional Vs. Nonprofessional"
Cincinnati Dental Assistants Association

"Child Patient"
Columbus Dental Assistants Association

"Tooth Carving"
Toledo Dental Assistants Association

"Simple Materia Medica for the Dental Assistant"
Philadelphia Association of Dental Nurses

"Rôle of the Dental Assistant in Gold Inlay Technic"
Pittsburgh Dental Assistants Association

"Assistant's Handling of Instruments and Dressings"
Tennessee State Dental Assistants Association

Twelfth District:

"Casting Backings and Cusps for Porcelain Facings Trupontic Teeth"
M. I. Barlow.....Kansas City, Kan.

"Gum Resection" (Pyorrhea Surgery)
C. P. Bevil.....Galveston, Texas

"Wiring of Fracture"
Trim Houston.....Corsicana, Texas

"Practical Suggestions in the Practice of Children's Dentistry"
H. R. Martin.....Mexia, Texas

"Controlling Some of the 'Variables' Presented in Full Denture Construction; Simplified Technic"
J. M. McMinn.....Dallas, Texas

"Perfect Method for Filling Cervical Cavities with Synthetic Porcelain"
Hugh W. Hodge.....Wichita, Kan.

"Some Occasional Castings"
Earl C. Glass.....Independence, Kan.

"Partial Denture Cast Surveying"
A. B. Coffin.....Hutchinson, Kan.

"Factors in Malocclusion; Remedial or Preventive"
Thomas M. Robertson..Coffeyville, Kan.

"Demonstration on Living Subjects for Full Lower Dentures Having a Stability Equal to or Better than the Best Modern Upper Dentures"
Charles Shepard Tuller.New Orleans, La.
Sydney C. Fournet.....New Orleans, La.

"Surgical Pyorrhea"
W. J. Lloyd.....Plainview, Texas

"Technic and Use of Face Cast Records in Oral Surgery and Prosthetics"
G. B. Van Blaricum....Minneola, Kan.

"Sanitary, Durable, Esthetic and Time-Saving Construction on Onlays, Eliminating Cutting Distal Interproximal Surface"
M. F. Jarrell.....Alexandria, La.

"Surgery in Advanced Periodontal Areas"
Albert J. Harper.....Shreveport, La.

"Immediate Denture Insertion"
C. B. Ball.....Frederick, Okla.

"Casting Direct to Porcelain Teeth and Facings"
John H. Smiley.....Mangum, Okla.

"Mottled Enamel"
Crawford A. McMurray...Ennis, Texas

"Simple Instrument for Measuring Cement Liquid by Volume, at Same Time Keeping the Remaining Liquid in the Container Sealed"
C. S. Kile.....Hutchinson, Kan.

"Teaching Mouth Hygiene to Children"
D. C. McCord.....Albany, Texas

"Extra-Oral Skeletal Traction for Complicated Fractures of the Jaws"
L. D. Roach.....Shreveport, La.

"Immediate Denture Insertions" (Demonstrating simplified technic of construction)
Reed R. Hatfield.....Wichita, Kan.

"Educational Exhibit"
Leon R. Kramer.....Hanover, Kan.

"Removal of a Difficult Third Molar and Impacted Third Molars"
J. W. Fields.....McPherson, Kan.

"General Roentgen-Ray Work with a Dental Machine in a Small Town"
J. M. Browder.....Weatherford, Texas

"Surgical Eradication of Pyorrhea Pockets"
B. F. Thielen.....Paris, Texas

"Opening the Bite to Restore Normal Relations and Functions of the Teeth and Normal Physiognomy"
W. B. Dormon.....Nashville, Ark.

"Comparison in Efficiency of Various Type Teeth"
A. M. Bradley.....Muskogee, Okla.

"Regeneration of Alveolar Bone, After Removal of Fibroma of Mandible"
George Ellis Sandoz...New Orleans, La.

"Casting Gold Inlays, Using Medium Heat to Get Necessary Expansion"
F. G. White.....Fort Smith, Ark.

"Anatomic Amalgam Restorations"
A. L. Butler.....Lewisville, Ark.

"Pin Inlay Technic"
John W. Richmond....Kansas City, Kan.

"Simplified Procedure for Making One Piece Castings"
Seymour Solomon.....Monroe, La.

"Gold Fillings"
J. A. Foster.....Homer, La.

"Curing Dental Rubber"
C. L. Jones.....Altus, Okla.

"Application of Silver Nitrate in Preservation of the Teeth"
W. R. Carrington....San Angelo, Texas

"General Survey of Oral Conditions Pertaining to Leprosy as Determined in the National Leprosarium"
Spencer B. McNair.....Carville, La.
Bernard M. Presjean.....Carville, La.

"Full Denture Construction" (moving picture)
Bertram H. Downs.....
.....Colorado Springs, Colo.

"Simple Method of Inducing Analgesia and Mild Anesthesia with Ethyl Chloride"
Rowe Smith.....Texarkana, Ark.

"Surgical Eradication of Pyorrhea"
E. L. Fortier.....New Orleans, La.

"Incisal Angle Restorations"
Andrew R. Whitley....New Orleans, La.
Charles E. Mary.....New Orleans, La.

"Visual Education in Dentistry"
L. H. Pitt.....Pittsburgh, Texas

"Aids to Exodontia"
P. C. Nordlinger.....Little Rock, Ark.

"Carved Soap Models Demonstrating Different Classifications of Anatomy Relative to Impacted Mandibular Molars"
George E. Weight.....Wichita, Kan.

"Construction of Fixed Bridges for Anterior Regions of the Mouth, Using Pin Facings"
J. E. Zoder.....Opelousas, La.

"Cast Crown Abutment with Cement Vent—Double Porcelain Tip Pontic"
Wayne H. Speer.....Houston, Texas.

"Synchronizing Occlusion and Porcelain Inlay"
H. O. Warrick.....Enid, Okla.

"Electroconductive Casting"
Frank D. Layman...Whitewright, Texas

"Topical Anesthetic"
L. J. Wyatt.....Kansas City, Kan.

"Gun Shot Wound with Loss of Maxillary Sinus; Normal Occlusion Through Dental Appliances"
James T. Peay.....Little Rock, Ark.
J. O. Hall.....Little Rock, Ark.

"Clinical and Technical Dental Cinematography"
S. H. McAfee.....New Orleans, La.
Wallace H. Kern.....New Orleans, La.

"What Is Meant by Roentgen-Ray Diagnosis"
Harry M. Laufer.....New Orleans, La.

"Removable Bridge Attachments"
E. E. Welch.....Topeka, Kan.

"Gingival Medication and Stimulation"
Walter R. Sivley.....Abilene, Texas

"Immediate Denture Service"
W. M. Nicaud.....New Orleans, La.
S. C. Aleman.....New Orleans, La.

"Some Anatomic Considerations Pertinent to Oral Surgery"
Cornelius DeBey.....Denver, Colo.

"Silver Inlays for Posterior Teeth"
Seisel B. Darracott.....Marksville, La.

"Better Amalgam Restorations"
Cash B. Erway.....Hays, Kan.

"Full Upper Impression of Edentulous Mouths"
B. J. LaCour.....Welsh, La.

"Painless, Quick Method of Inserting Hypodermic Needle; Method of Preventing Clasp from Slipping on Inclined Teeth"
Wells Healey.....New Orleans, La.

"Dental Economics—How to Handle the Patient"
A. E. Porter.....New Orleans, La.

"Prophylaxis: Oklahoma Method of Brushing Teeth"
Arthur L. Walters.....Tulsa, Okla.

"Rural Surgery"
T. C. W. Magee.....Franklinton, La.

"Some Short Cuts in Practice"
W. Graves Peay.....Little Rock, Ark.

"Interesting Discoveries in an Orthodontic Practice by Means of the Roentgen Rays"
J. A. Gorman.....New Orleans, La.

"Controlling Mouth Secretions in Impression Taking"
Ralph C. Williams.....El Dorado, Ark.

"Pedodontic Roentgenography"
Leo J. Schoeny.....New Orleans, La.

"Dentist's Responsibility for Preservation of Continuity of the Dental Arches"
L. D. Mitchell.....Arkansas City, Kan.

"A Practical Precision Full Denture Technic"
Fred J. Swisher.....Denver, Colo.

"Postoperative Complications in Exodontia"
Menifee R. Howard.....Denver, Colo.

"Conservative Technic for Surgical Eradication of Periodontal Disease"
Henry J. Feltus.....Baton Rouge, La.

"Technic for the Removal of Torus Palatinus"
Joseph P. Wahl.....New Orleans, La.

"Indirect Inlay Technic"
Prescott E. Smith.....New Orleans, La.

"Vulcanite Orthodontic Appliance"
E. F. Buckley.....Little Rock, Ark.

"Wire Clasp Technic for Partial Denture"
R. A. Denman.....Beloit, Kan.

"All Porcelain Richmond (Modified) Crown"
Earle D. Meetze.....New Orleans, La.

"Definite Steps in Securing Accurate Models of Various Types"
William John Healy...New Orleans, La.
Alfred E. Smith.....New Orleans, La.

"Various Appliances Used in the Retention of Fractures"
A. C. Sloan.....Dallas, Texas

"Amalgams"
Clyde G. Barthelemy...New Orleans, La.
H. M. Moore, Jr.....New Orleans, La.
Daniel V. Rittner.....New Orleans, La.

"Volatile Backing Casting Patterns for Interchangeable Facings and Pontics"
Norton L. Wheeler.....Tulsa, Okla.

Florida

"Paradentectomy"
M. Francis Wielage.....Miami, Fla.

"Hydrocolloid Impression Technic for Inlays and Bridges"
A. W. Sears.....Jacksonville, Fla.

"Amalgam Inlay Technic"
G. B. Tison.....Gainesville, Fla.

"Pneumatic Bone Chisel Technic"
A. Malcolm Smith, Jr.....Tampa, Fla.

Illinois

"Crown and Bridge Work"
Harry Spiro.....Chicago, Ill.

"Mandibular and Mental Injections with Procaine"
Simon B. Matzkin.....Chicago, Ill.

"Investing and Eliminating Wax Patterns with Centrifugal Force"
George Ambuehl.....Wilmette, Ill.

"Points for General Practitioner to Consider in the Removal of Teeth; Sutureless Flap in Difficult Single Extractions"
George Schneider.....LaSalle, Ill.

"Gnathostatic Diagnosis in Orthodontia"
B. L. Herzberg.....Chicago, Ill.

"Preparation of Mouth for Artificial Restorations"
C. H. Grandstaff.....Chicago, Ill.

"Photography in the Dental Office"
Jerome J. Vlk.....Chicago, Ill.

"Healing of Wounds"
R. S. Claflin.....Chicago, Ill.

"Treatment of Fractures of the Jaw"
Emil L. Aison.....Chicago, Ill.

"Principles to Be Considered in a Mouth Hygiene Educational Program"
C. F. Deatherage.....Springfield, Ill.

"Dentistry and Preventive Orthodontia for Children"
Francis M. Yager..Hubbard Woods, Ill.

"Orthodontia"
William W. Martin.....Chicago, Ill.

"Anthropology"
John B. Ruyle.....Champaign, Ill.

"Application of Radium in the Treatment of Mouth Cancer"
Max Cutler (M.D.).....Chicago, Ill.
J. M. Everett.....Chicago, Ill.

Indiana

"Classification of and Technic for Removal of Impacted Third Molars"
Glenn J. Pell.....Indianapolis, Ind.
G. Thaddeus Gregory Indianapolis, Ind.

"Simplified Treatment of Vincent's Infection"
J. H. Cusick.....Terre Haute, Ind.

"Porcelain Inlays Without a Platinum Matrix"
Robert K. George.....Indianapolis, Ind.

"Dental Model Surveying"
N. G. Wills.....Connersville, Ind.

"Method of Determining the Correct Posterior Palatal Extension of Upper Dentures"
H. J. Longcamp.....Aurora, Ind.

"Diagnosis and Treatment of Vincent's Stomatitis"
Bernard A. Martin....Indianapolis, Ind.

"Simplified Full Denture Construction; Stressing Grinding, Setting and Milling, to Prevent Cusp Interference"
Robert F. Denny.....Indianapolis, Ind.

"Roofless Dentures"
A. P. Craig.....Gary, Ind.

Iowa

"Individual Characteristics in Artificial Dentures"
W. J. Cameron.....Des Moines, Iowa

"Orthodontia"
Leslie Bodine Higley....Iowa City, Iowa

"Dentures"
Carl T. Ostrum.....Ankeny, Iowa

"Brushing Technic"
Olin E. Hoffman.....Des Moines, Iowa

"Practical High-Heat Inlay Furnace; How It Can Be Easily and Cheaply Made"
C. A. DeLano.....Cedar Rapids, Iowa

"Mouth Classification and Oral Diagnosis"
Floyd C. Bridge.....Storm Lake, Iowa

"Lower Primary Impressions"
T. C. Raymond.....Storm Lake, Iowa

"Full Upper Impressions"
E. B. Smith.....George, Iowa

"Centric and Balancing Occlusion"
A. J. Tanner.....Cherokee, Iowa

"Lower Rebase"
Frank W. Nelson.....Sheldon, Iowa

"Facial Casts and Pictures"
O. A. Christensen.....Albert City, Iowa

"Full Upper Impression"
F. M. Minnich.....Laurens, Iowa

"Lower Primary Impression and Lower Rebase"
F. A. Barnes.....Cherokee, Iowa

"The Patient"
C. E. Summy.....Paulina, Iowa

Maryland

"Some Useful Orthodontic Instruments"
E. W. Swinehart.....Baltimore, Md.

Massachusetts

"Simplified Chrome Nickel Technic for Orthodontia Appliances"
George C. Brown.....Worcester, Mass.

"Exodontia for the General Practitioner"
Wells A. Daniels.....Springfield, Mass.

"Application of Knowledge of Nutrition in General Practice"
Mark D. Elliott.....Boston, Mass.

"Hollow Inlay Technic—How and When to Use Thimble Abutments"
Charles P. Fortin....New Bedford, Mass.
G. M. Teasdale....New Bedford, Mass.

"Series of Arch Forms to Assist in Diagnosis of Orthodontia Cases"
William H. Gilpatric.....Boston, Mass.

"Local Anesthesia and Minor Oral Surgery"
James H. Maycock.....Gardner, Mass.

"New Indirect Technic for a Hollow Inlay"
Copeland Merrill.....Wellesley, Mass.

"Full Denture Basing and Bases"
Norman B. Nesbett.....Belmont, Mass.

"Prescriptions and Office Preparations"
Arthur T. Palmer.....Lynn, Mass.

"Gold Inlay—Preparation and Technic"
Horace E. Pope.....Beverly, Mass.

"Use of High Frequency Current in Surgery of Mouth and Jaws"
Joseph B. Rockett.....Boston, Mass.

"Broken Joint in Fixed Bridgework Where Abutment Teeth Are Tipped; Wrought Wire Clasps for Partial Dentures"
Lawrence M. Staples.....Boston, Mass.

Minnesota

"Immediate Denture Technic"
Harold L. Harris.....St. Paul, Minn.

"Elastic Impression Material Washes in Prosthetic Dentistry"
Charles L. Nelson....Fergus Falls, Minn.

"New Development in Rapid Hot Oil Technic for Thermoplastic Dentures and Orthodontic Plates"
Lawrence E. Spear...Minneapolis, Minn.

"Partial Dentures"
M. M. Van Campen...Barnesville, Minn.

"Preparation of Mouth for Dentures" (Illustrated with casts and face masks)
L. J. Salisbury.....St. Paul, Minn.

"Effective Application of Mechanics in Three-Quarter Crown Construction—A New Principle and Its Technic"
W. E. Jones.....St. Paul, Minn.

"One Piece Plaster Impression for Partial Dentures"
M. J. Cohler.....St. Paul, Minn.

"Vertical Dimensions in Full Dentures"
Maurice L. Green.....St. Paul, Minn.

"New Type of Clasp"
C. R. Flandrick.....St. Paul, Minn.

"Developing of Roentgenograms for the General Practitioner"
M. E. Bonner.....St. Paul, Minn.

"New Inlay Pattern Technic"
I. E. Siqueland.....St. Paul, Minn.

"Immediate Postextraction Care and Closure of Socket, Employing a Splint"
L. C. Brusletten.....Faribault, Minn.

"Bridgework"
Donald H. Colby.....St. Paul, Minn.

"Synthetic Porcelain"
L. M. Peifer.....St. Paul, Minn.

"Lingual Access Gold Foil"
M. G. Walls.....St. Paul, Minn.

"Partial Impression Index"
Ralph H. Boos.....Minneapolis, Minn.

"Partial Denture Design, Including New Metal Alloys"
George W. Boos.....Minneapolis, Minn.

Group Clinic

"Accurate Balance and Function in All Restoration Work, Using a Plane Line Articulator"
F. S. Meyer.....Minneapolis, Minn.
J. B. Towey.....Minneapolis, Minn.
William J. Von Bank..New Ulm, Minn.

"Bridgework"
H. F. Marston.....Minneapolis, Minn.

Mississippi

"Correction of Occlusion in Treatment of Nerve Disturbance and Pyorrhea"
J. F. Kilpatrick.....Clarksdale, Miss.

"Design and Construction of Stainless Steel Appliances"
Charles A. Ray, Jr.....Meridian, Miss.

"Immediate Insertion of Dentures"
N. B. Pierce.....New Albany, Miss.

"Practical Points on Children's Dentistry from Forsyth Infirmary Postgraduate Course"
D. C. Williams.....Utica, Miss.

"Technic for Drawing Malposed Cuspid into Proper Occlusion, Opening the Bite; Other Regulating Appliances"
O. L. Colee.....Magnolia, Miss.

"Simple Method of Removing Broken Root Tips; Immediate Relief for Painful or Dry Sockets"
C. A. Moore.....Lexington, Miss.

Group Clinic

"Pattern Making—Both Direct and Indirect, for Casting; Newer Method for Immediate Anterior Bridge Restoration"
J. H. Brown.....Newton, Miss.
G. F. Haynes.....Laurel, Miss.
J. D. Harrell, Jr.....Laurel, Miss.

New York

"Oral Surgery, Exodontia, Anesthesia (General and Local) and Fractures"
Phillip R. Courten.....Jamaica, N. Y.

"Helpful Hints for a General Practitioner"
C. Raymond Wells.....Brooklyn, N. Y.

"Technic to Eliminate Unnecessary Armamentaria in Pulp Canal Procedures; Maintaining Asepsis During the Operation"
Harry Albert.....New York City

"Slice and Lock Preparation for Bridge Abutments"
Paul W. Zillman.....Buffalo, N. Y.

North Carolina

"Full Dentures" (Illustrated with motion pictures)
L. G. Coble.....Greensboro, N. C.

"Value of Ethyl Chloride in Children's Dentistry" (Illustrated with motion pictures)
H. A. Edwards.....Greensboro, N. C.

"Gold Inlays and Bridge Abutments"
W. R. Hinton, Jr.....Greensboro, N. C.

"Fractures of Mandible"
William D. Lanier, Jr.....Oteen, N. C.

"Practical Exodontia and the Control of Dry Sockets"
Harold E. Story.....Charlotte, N. C.

"Method of Determining the Pathologic Condition of the Blood in Its Relation to Dentistry"
O. C. Barker.....Asheville, N. C.

"Study Models and Check-Bites Dealing with Occlusal Stress in Periodontal Lesions"
W. F. Clayton.....High Point, N. C.

South Dakota

"Casting Removable Bridges"
B. E. Jacobs.....Garretson, S. D.

"Wax Gum Technic"
Fred J. Armstrong.....Sioux Falls, S. D.

Tennessee

"Treatment of Lower Full Denture Impression for Greater Comfort and Stability"
M. L. Jarrell.....Chattanooga, Tenn.

"Anatomic Landmarks Which Determine the Correct Peripheral Outline of a Lower Denture"
J. Benton Neil.....Nashville, Tenn.

"Prosthodontia"
Charles L. Buckner.....Knoxville, Tenn.

"Removable Bridges Employing Stress-breaker"
Eugene F. Thomas.....Memphis, Tenn.

Texas

"Some Interesting Results in Reconstruction Work" (Cases shown before and after treatment)
Horace E. Wood.....Dallas, Texas

"Restorative Dentistry"
John W. Helton.....Jacksonville, Texas

"Traumatic Avulsion of Entire Maxilla with Laceration of Face"
Franz William Stumpf.....
.....San Antonio, Texas

"Amalgam Restorations"
R. F. McCasland.....Tulia, Texas

"Effective Method of Maintaining Dry Field in Operative Dentistry"
Dan C. Peavy.....Cuero, Texas

"Staining of Teeth to Be Used in Denture Construction"
J. Dexter Eoff.....Ballinger, Texas

"Ground Porcelain Jacket Crowns"
Joseph P. Arnold.....Houston, Texas

"Fixed Bridgework with a Removable Labial Plate"
Taylor M. Wheat....San Antonio, Texas

"Gnathostatic Diagnosis and Fundamental Principles of Appliance Application"
P. J. Murphey.....Dallas, Texas
Willis H. Murphey...Fort Worth, Texas

"Various Appliances Used in Retention in Fractures"
A. C. Sloan.....Dallas, Texas

"Alveolar Bone Regeneration Following Periodontal Treatment"
L. A. Neil.....El Paso, Texas

Washington

"Complete Denture Construction Emphasizing Selection of Tooth Form, Shading and Arrangement of Teeth"
F. J. Hoelscher.....Seattle, Wash.

West Virginia

"Oral Surgery" (Photographic exhibit)
Edward C. Armbrecht.Wheeling, W. Va.

"Roentgen Rays in the General Practice of Dentistry"
J. Bernard Poindexter.....
.....Huntington, W. Va.

"Periodontia for the General Practitioner"
Charles M. Malcolm.Charleston, W. Va.

Wisconsin

"'Selling' Dentistry with the Roentgen Rays"
F. J. Martin.....Medford, Wis.

"Treatment of Vincent's Infection and Pyorrhea"
E. D. Cunningham.....Tomah, Wis.

"Chrome Alloy Orthodontic Appliances Constructed with a Special Soldering Technic"
J. B. Franklin.....Milwaukee, Wis.

"Simplified Technic for Securing Impression of Gingival Cavities for Gold and Porcelain Inlays"
H. M. Uebele.....Milwaukee, Wis.

"Practical Immediate Denture Service" (Surgical and prosthetic procedure)
H. G. Grewe.....Eau Claire, Wis.
R. H. Grewe.....Eau Claire, Wis.

"Conductive Anesthesia"
William G. Morrisey....Reedsville, Wis.

"Taking of Facial Contour and Surgical Preparation for Dentures by Means of Models"
E. H. Redeman.....Marinette, Wis.

THE NEW ORLEANS SESSION

RADIO PROGRAM

Tuesday, November 5

Station WSMB, "The Mouth as an Indicator of General Health"
H. C. Pollock.....St. Louis, Mo.

Station WDSU, "Trench Mouth a Treacherous Disease of the Mouth"
T. A. Hardgrove.....Fond du Lac, Wis.

Station WBNO, "Dental Care for the American Masses"
E. H. Bruening.....Omaha, Nebr.

Station WWL, "Dental Care for the Population of England"
John T. Hanks.....New York City

Station WJBW, "Preventing Children's Teeth from Becoming Badly Decayed"
E. L. Pettibone.....Cleveland, Ohio

Wednesday, November 6

Station WSMB, "Advance in Dental Science in the Past Fifty Years"
A. L. Midgley.....Providence, R. I.

Station WDSU, "Why Crooked Teeth?"
O. W. Brandhorst.....St. Louis, Mo.

Station WWL, "What Every Wearer of Dentures Should Know"
Charles Lane.....Detroit, Mich.

Station WBNO, "Care of the Preschool Child's Teeth"
E. H. Jones.....Cincinnati, Ohio

Station WJBW, "Fear of Dentistry Due to Pain Most of Which Can Be Prevented"
Edward Reiter.....Cleveland, Ohio

Thursday, November 7

Station WSMB, "Care of the School Child's Teeth"
George E. Morgan.....Milwaukee, Wis.

Station WDSU, "Your Teeth and Mine"
C. F. Deatherage.....Springfield, Ill.

Station WWL, "Dentistry and Public Health"
William R. Davis.....Lansing, Mich.

Station WBNO, "How Virginia Cares for the Teeth of Its Children"
N. Talley Ballou.....Richmond, Va.

Station WJBW, "Masticating Machine"
J. B. Wisan.....Elizabeth, N. J.

SCHOOL PROGRAM

Tuesday, November 5

Annunciation, Marais & Spain
Dorothea F. Radusch.Minneapolis, Minn.

St. Stephen, 928 Napoleon Ave.
David B. Hill.....Salem, Ore.

Jesuits High School, 4533 S. Carrollton Ave.
John Bauer.....Lincoln, Nebr.

Sacred Heart of Jesus, 3236 Canal St.
C. L. Drain.....Iowa City, Iowa

Delgado Trade School, City Park Ave.
J. H. Pearce.....Chicago, Ill.

Sacred Heart School
Francis Hook.....Detroit, Mich.

Wednesday, November 6

Holy Name Convent of Mercy, 1930 Calhoun St.
P. J. Warren.....Lakewood, Ohio

Eleanor McMain High School, 5712 S. Claiborne Ave.
W. A. Price.....Cleveland, Ohio

Warren Easton High for Boys, 3019 Canal St.
Lon W. Morrey.....Chicago, Ill.

St. Joseph Academy, 2116 Ursuline Ave.
F. L. Adams.....Tampa, Fla.

Allen High School of Commerce, Nashville & Freret St.
F. E. Hogeboom.....Los Angeles, Calif.

Holy Angels Academy, 3523 N. Rampart St.
Chalmers B. Webster..Montgomery, Ala.

Francis T. Nichols Vocational School for Girls, Laurel & Antoine Sts.
T. A. Gardner.....Omaha, Nebr.

Redemptorist, Prytania & Third
R. C. Leonard.....Baltimore, Md.

John McDonogh Girls' High School, Esplanade & Dorgenois St.
Margaret Jeffreys.....Philadelphia, Pa.

Margaret S. Hanson Normal School, 1532 Calliope St.
Gladys Eyrich.....Jackson, Miss.

Thursday, November 7

Samuel J. Peters High School of Commerce, Broad & Baudin Sts.
F. C. Lammons.....Atlanta, Ga.

Ursuline Academy, 2635 State St.
John E. Gurley.....San Francisco, Calif.

Martin Behrman School, 715 Opelousas Ave.
Margaret Bailey.....Philadelphia, Pa.

Holy Cross College, Dauphine & Reynes Sts.
E. A. Branch.....Raleigh, N. C.

Dominican College, 7214 St. Charles Ave.
Lillian Cain.....Washington, D. C.

St. Aloysius, 1117 Esplanade Ave.
W. C. McBride.....Detroit, Mich.
Sacred Heart Academy, 4521 St. Charles Ave.
Ruth Rogers.....Detroit, Mich.

LUNCHEON CLUB PROGRAM

Tuesday, November 5—12:15 p.m.

Lions Club of New Orleans, Roosevelt Hotel
Walter T. McFall.....Atlanta, Ga.
Kiwanis Club of New Orleans, St. Charles Hotel
Arthur C. Wherry..Salt Lake City, Utah
Bond Club of New Orleans, St. Charles Hotel
Norman H. Denner.....Cleveland, Ohio
Big Ten Club of New Orleans, St. Charles Hotel
Frederick B. Noyes.....Chicago, Ill.

Wednesday, November 6—12:15 p.m.

Young Men's Business Club, Roosevelt Hotel
Harvey J. Burkhart.....Rochester, N. Y.
Rotary Club of New Orleans, Roosevelt Hotel
Arthur D. Black.....Chicago, Ill.
New Orleans Business and Professional Women's Club, Roosevelt Hotel
Geneva Groh.....Philadelphia, Pa.

Thursday, November 7—12:15 p.m.

Members Council, Roosevelt Hotel
Charles A. Sweet.....Oakland, Calif.
Cooperative Club of New Orleans, Kolb's Restaurant
Boyd S. Gardner.....Rochester, Minn.
Virgilian Club, Monteleone Hotel
C. Willard Camalier..Washington, D. C.

WOMEN'S PROGRAM

Monday, November 4

9:30 p.m. Old Plantation Dance, Municipal Auditorium (Informal)

Tuesday, November 5

9:30 a.m. First General Meeting of the American Dental Association, Municipal Auditorium.

1:30 p.m. Conducted group tours through the old French Quarter of New Orleans. (Admission will be by ticket, to be secured on registration. The trip starts from the Roosevelt Hotel.)

7:45 p.m. Second General Meeting of the American Dental Association at the Municipal Auditorium.

Wednesday, November 6

9:30 a.m. Conducted group tours through the old French Quarter of New Orleans. (Admission by ticket only, to be secured on registration. The trip starts from the Roosevelt Hotel.)

2:00 p.m. Boat ride around New Orleans harbor. (Admission by ticket only. The boat will leave Canal Street and the River at 2:00 p.m.)

7:45 p.m. Third General Meeting of the American Dental Association, Municipal Auditorium.

Thursday, November 7

11:00 a.m. The Ladies Committee of the First and Second District Dental Society of Louisiana will entertain the visiting women with a tour of the City and refreshments at the Airport. The tour will leave the Roosevelt Hotel promptly at 11:00 a.m. (Tickets must be secured in advance.)

8:30 p.m. President's Ball in the Tip Top Inn of the Roosevelt Hotel. (Formal) (A supper dance in honor of the retiring President, Frank M. Casto.

HEALTH AND SCIENTIFIC EXHIBITS

1. American Medical Association, Chicago, Ill.: Disinfectants.
2. Harold F. Edwards, Shreveport, La.: Tumors of Mouth and Jaws.
3. American Mouth Health Association, Minneapolis, Minn.: American Mouth Health Association.
4. Illinois State Dept. of Public Health, Springfield, Ill.: Department of Public Health, Section of Mouth Hygiene.
5. Northwestern University Dental School, Chicago, Ill.: Graduate Study—An Exhibit of Research Theses.
6. Public Dental Service Society, Cincinnati, Ohio: Public Dental Service Society—Board of Education.
7. Samuel Rabkin, Cincinnati, Ohio: Evolution and Decline of Human Dentition.
8. American Red Cross, Washington, D. C.: Oral Hygiene Clinic in San Luis Valley, Colo.
9. National Congress of P.T.A., Washington, D. C.: Health and the Child.
10. American Society for Control of Cancer, New York City: Cancer Exhibit.
11. Loyola University School of Dentistry, New Orleans, La.

12. George B. Winter, St. Louis, Mo.: Removal of Impacted Third Molars.
13. Michael Reese Hospital, Chicago, Ill.: Cancer Exhibit.
14. University of Illinois, College of Dentistry, Chicago, Ill.
15. Ohio State University, College of Dentistry, Columbus, Ohio.
16. Council on Dental Therapeutics and Bureau of Chemistry, A.D.A., Chicago, Ill.
17. Arthur E. Smith, Los Angeles, Calif.: Plastic Surgery.
18. Georgia Dept. of Health, Atlanta, Ga.
19. American Dental Assistants Association, Detroit, Mich.
20. Dental Division, Department of Public Instruction, Honolulu, T. H.
21. Murray and Leonie Guggenheim Dental Clinic, New York City.
22. Charles Darlington, New York University, New York City: Microscopic Demonstration on Tumors of the Mouth.
23. George Hauser, New Orleans, La.: Mercy Hospital Exhibit.
24. Frederick C. Allen, Boston, Mass.
25. New York Institute of Clinical Pathology, New York City: Clinical Pathology.
26. American Dental Hygienists' Association, Boston, Mass.
27. Research Bureau of Standards, Washington, D. C.
28. Chicago College of Dental Surgery, Chicago, Ill.
29. A.D.A. Bureau of Public Relations, Chicago, Ill.: Bureau Exhibit.

ANNOUNCEMENTS

PAST PRESIDENTS' (A.D.A.) CLUB LUNCHEON

The Past Presidents' Club of the American Dental Association will hold its annual luncheon at 12:30 Tuesday, November 5, in Parlor "H," Roosevelt Hotel. The annual address will be delivered by H. E. Friesell. Every Past President in attendance at the New Orleans meeting is urgently requested to be present at this luncheon.

HOMER C. BROWN, *Secretary*,
Columbus, Ohio.

AMERICAN ACADEMY OF RESTORATIVE DENTISTRY

The American Academy of Restorative Dentistry will be in session from 9 a.m. until 5 p.m., November 2 and 3, in the Hunt Room of the St. Charles Hotel, at Common and St. Charles streets, New Orleans.

A. F. SCHOPPER, *Secretary*.

AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN

The Ninth Annual Meeting of the American Society for the Promotion of Dentistry for Children will be held at the Roosevelt Hotel, New Orleans, November 4.

WALTER T. MCFALL, *Secretary*.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

The American Society of Oral Surgeons and Exodontists will hold its Seventeenth Annual Meeting at the Jung Hotel, New Orleans, November 1 and 2. The annual banquet will be held on Friday evening, November 1.

HARRY BEAR, *Secretary*,
410 Professional Bldg.,
Richmond, Va.

ASSOCIATION OF MILITARY DENTAL SURGEONS

The Association of Military Dental Surgeons will hold its combined business meeting and banquet, November 6 at 6:30 p.m., in Room "E," Mezzanine Floor, Roosevelt Hotel, New Orleans.

FRANK P. STONE,
Colonel, Dental Corps, U. S. Army.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS

The annual meeting of the National Association of Dental Examiners will be held in Room "E," Roosevelt Hotel, November 2 and 3. Sessions will begin at 9:00 a.m. The Sunday afternoon session will be devoted to individual problems of the different state boards, and will be open for general discussion by the members.

R. P. THOMAS, *Secretary*.

AMERICAN ACADEMY OF PERIODONTOLOGY

The Twenty-Second Annual Meeting of the American Academy of Periodontology will be held at the St. Charles Hotel, New Orleans, October 31 and November 1 and 2. An annual feature of this meeting is the report of the Committee on Scientific Investigation. Clinics will also be presented. The annual banquet

will be held at the New Orleans Country Club, Saturday evening, November 2.

CLAYTON H. GRACEY,
966 Fisher Building,
Detroit, Mich.

ANNUAL MOUTH HYGIENE LUNCHEON

The Annual American Dental Association Mouth Hygiene Luncheon will be held November 6 at 12:15 p.m. at La Louisiane Restaurant, New Orleans. The speaker will be Charles A. Sweet, Oakland, Calif.

E. L. PETTIBONE, *Chairman.*

STATE DIRECTORS AND MOUTH HYGIENE WORKERS ANNUAL BREAKFAST CONFERENCES

The State Directors and Mouth Hygiene Workers Annual Breakfast Conferences will be held in Room "H" of the Roosevelt Hotel, November 5-6-7 at 8:00 a.m.

E. L. PETTIBONE, *Chairman.*

THE AMERICAN DENTAL GOLF ASSOCIATION

The sixteenth annual tournament of the American Dental Golf Association will be held in New Orleans, November 4: Class "A," New Orleans Country Club; Class "B," Metairie Golf Club; Class "C," the Colonial Country Club. Numerous prizes for all classes will be given. The Calcutta Pool dinner will be held Sunday evening, November 3, at the Roosevelt Hotel.

E. RAY BROWNSON, *Secretary.*

STATE SOCIETY OFFICERS' CONFERENCE

The State Society Officers' Conference will be held November 3, in the Dome Room, Roosevelt Hotel, New Orleans, with registration at 9:00 a.m. All State Society Officers are invited to be present.

COMMITTEE ON ECONOMICS OF THE AMERICAN DENTAL ASSOCIATION

The meeting of the Committee on Economics will be held Sunday, November 3, at 2 p.m., Roosevelt Hotel, New Orleans. All members of the committee and all committee deputies are requested to be present.

RESEARCH COMMISSION

The Research Commission of the American Dental Association will hold meetings, November 4, 2:30 p.m., and November 7, 5:30 p.m., in Room "C," Mezzanine Floor, Roosevelt Hotel.

EXECUTIVE BOARD OF RESEARCH COMMISSION

The Executive Board of the Research Commission will hold meetings November 2, at 11:00 a.m., and November 3, at 11:00 a.m., Room "C," Mezzanine Floor, Roosevelt Hotel.

AMERICAN DENTAL TRAPSHOOTERS LEAGUE

The American Dental Trapshooters League will meet at New Orleans, November 4, at 2:00 p.m. The shoot will be held at the Jefferson Skeet Club, Harahan, La., 11 miles from Downtown New Orleans, on Jefferson Highway.

First Event—100 targets 16 yards for National Championship Cup, and second and third high cups.

Second Event—50 targets 16 yards for National State Championship, 2 man team race.

Third Event—25 targets—Skeet shooting for National Champion and runner-up cups.

(The two high men from each state shooting event Number One will be the team from that state.)

This is the first time a champion in skeet will be made in the Dental Shooting League. All events will be published in our journal this year. There will be a stag dinner in the evening with the golfing association.

Every dentist showing his 1935 A.D.A. card is eligible to shoot. There are no dues.

GEORGE J. MIRE, *Local Secretary,*
1781 N. Broad St.,
New Orleans, La.

AMERICAN ASSOCIATION OF DENTAL EDITORS

The Fifth Annual Meeting of the American Association of Dental Editors will be held in the Roosevelt Hotel, New Orleans, November 2. There will be morning, afternoon and evening sessions devoted to the interest of dental journalism.

O. W. BRANDHORST, *Secretary.*

AMERICAN DENTAL ASSISTANTS ASSOCIATION

The Eleventh Annual Meeting of the American Dental Assistants Association will be held at New Orleans, November 4-8. Headquarters will be the Bienville Hotel.

LUCILE S. HODGE, *General Secretary,*
401 Medical Arts Bldg.,
Knoxville, Tenn.

AMERICAN DENTAL HYGIENISTS' ASSOCIATION

The Twelfth Annual Meeting of the American Dental Hygienists' Association will be held at the Monteleone Hotel, New Orleans, November 4-8. The annual banquet will be held November 5.

AGNES G. MORRIS, *Secretary.*

ASSOCIATION OF AMERICAN WOMEN DENTISTS

The Fourteenth Annual Meeting of the Association of American Women Dentists will be held at the Roosevelt Hotel, New Orleans, November 4. Registration and business meeting in the morning; banquet, 6:00 p.m.

E. PEARLE BISHOP, *Secretary,*
316 Republic Bldg.,
Denver, Colo.

DELTA SIGMA DELTA FRATERNITY

The Fifty-First Annual Meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will be held in the St. Charles Hotel, New Orleans, November 4. The first session will be held at 9:30 a.m., followed by the usual complimentary luncheon to members, after which an afternoon session will be held, if there should be any unfinished business of previous sessions to transact. The annual banquet will take place at 6:00 p.m. in the same hotel. When registering for the banquet it will be necessary to present membership card to the committee in charge. Hotel reservations should be made as soon as possible by those members expecting to attend the meeting and such requests may be sent to A. C. Broussard, Grand Master of New Orleans Auxiliary, Maison Blanche, New Orleans.

By Order of the Supreme Council,
G. WALTER DITTMAR, *Supreme Grand Master.*

OMICRON KAPPA UPSILON FRATERNITY

There will be a luncheon for members of Omicron Kappa Upsilon at 12 m., November 6, at the Roosevelt Hotel, New Orleans. A short program will be provided. All members who are in attendance at the convention of the American Dental Association are urged to be present. F. J. Genre, 6363 St. Charles Ave., is chairman of the Local Committee.

ABRAM HOFFMAN,
Supreme Secretary-Treasurer,
311 East Chicago Ave.,
Chicago, Ill.

XI PSI PHI FRATERNITY

The Xi Psi Phi Fraternity headquarters will be the Monteleone Hotel. The annual banquet will be held November 4, at the Monteleone Hotel, at 6:00 p.m. All members of the fraternity are invited to attend.

E. A. GAMARD, *Chairman.*

ALPHA OMEGA FRATERNITY

Official headquarters of the Alpha Omega Fraternity during the annual meeting of the American Dental Association will be the DeSoto Hotel, New Orleans. The banquet will be held at the DeSoto Hotel, November 4 at 8:00 p.m. All fraters are urged to register on their arrival.

By Order of the Supreme Chancellor
ALVIN H. BERMAN, *Supreme Scribe,*
1445 North Gay Street,
Baltimore Md.

PSI OMEGA FRATERNITY NATIONAL ALUMNI CHAPTER

Psi Omega headquarters, during the meeting of the American Dental Association, will be the Jung Hotel, New Orleans. All visiting brothers are requested to register on arrival at the Psi Omega headquarters. The annual banquet of the National Alumni Chapter will be held at the Jung Hotel, November 4, at 6:30 p.m. All members and their wives or friends will be welcome. The Executive meeting of the Chapter will be held at headquarters November 5, at 9:30 a.m.

FRED A. RICHMOND, *Grand Master,*
Federal Reserve Life Building,
Kansas City, Kan.

NEW ORLEANS ATHLETIC CLUB

The New Orleans Athletic Club wishes to extend to the visitors to the American Dental Association the privileges of the club during their meeting in New Orleans in November. The members' badge will admit them to the club.

THE ARMY AND NAVY CLUB OF NEW ORLEANS

The Army and Navy Club of New Orleans wishes to extend the privileges of the club to the military members of the American Dental Association during the Seventy-Seventh Session in New Orleans. Those desiring to visit the club may secure cards through Dr. Dupuy, chairman of the Information Committee.

RAILROAD RATES TO NEW ORLEANS, LA.

The American Dental Association has discontinued the use of the Identification Convention Certificate, and again this year is using the "Certificate Plan." The Certificates will be obtainable from your railroad agent, and NOT THROUGH THIS OFFICE. Following is full information regarding the plan.

The following directions are submitted for your guidance:

1. Be sure that when purchasing going ticket you request a CERTIFICATE. *Do not make the mistake of asking for a "Receipt."*

2. Present yourself at the railroad station for tickets and Certificates at least 30 minutes before departure of train on which you will begin your journey.

3. *Certificates are not kept at all stations.* If you inquire at your home station, you can ascertain whether Certificates and through tickets can be obtained to place of meeting. If they are not obtainable at your home station, the agent will inform you at what station they can be obtained. You can in such a case purchase a local ticket to the station which has Certificates in stock, where you can purchase a through ticket and at the same time ask for and obtain a Certificate to place of meeting.

4. *Immediately on your arrival at the meeting present your Certificate* to the endorsing officer, Max E. Ernst, Vice-President, as the reduced fares for the return journey will not apply unless you are properly identified as provided for by the Certificates.

5. *It has been arranged that the Special Agent of the Carriers will be in attendance, November 5 to 8 from 9:30 a.m. to 5:00 p.m., to validate Certificates.* If you arrive at the meeting later than November 8, after the Special Agent has left, you cannot have your Certificate validated and consequently you will not obtain the benefit of the reduction on the home journey.

6. Certificates issued to children at half fares will be counted the same as Certificates held by adults.

7. If your Certificate is duly validated, you will be entitled up to and including November 13 to a return ticket via the same route over which you made the going journey *at one-half of the regular one-way tariff fare* from the place of meeting to the point at which your Certificate was issued. *(The identical route must be used in going and in returning in order to benefit under the Certificate plan.)*

8. Return tickets issued at the reduced fares will not be good on any limited train on which such reduced fare transportation is not honored.

9. *No refund of fare will be made on account of failure to obtain a proper Certificate when purchasing going tickets, nor on account of failure to present validated Certificate when purchasing return ticket.*

A program of exceptional merit has been arranged, and we extend to you a cordial invitation to be present.

N.B. Reduced Round-Trip fares, which in some cases are lower than Convention fares, will apply from some territories. Be sure to inquire of ticket agent which fare is lower.

Illinois State Dental Society "Special" to New Orleans

The Illinois State Dental Society will operate a special de luxe train on the Illinois Central Railroad, leaving Chicago at 9 a.m., November 3 (stopping at Champaign, Mattoon, Effingham and Carbondale) and reaching New Orleans at 7:30 a.m., November 4. The round trip from Chicago, first class, is $37.55; chair car, $29.40, with reduction in rates to chair car parties of fifteen or more. The return journey may be made individually. Those attending the meeting from other sections are invited to join the party in Chicago or at any of the points mentioned above. For further information, address Dr. George W. Hax, 8 S. Michigan Ave., Chicago.

RAILROAD SELLING DATES

TRANS-CONTINENTAL PASSENGER ASSOCIATION
WESTERN PASSENGER ASSOCIATION

Sales dates for Colorado (Julesburg only), Illinois, Iowa, Kansas, Manitoba (see note), Minnesota, Missouri, Nebraska, Northern Michigan, Wisconsin ..... Oct. 29-Nov. 4, Incl.

Colorado (except Julesburg), Wyoming, N. Dakota, S. Dakota.... Oct. 28-Nov. 3, Incl.

Arizona, British Columbia, Idaho, Montana, Nevada, New Mexico, Utah, Oregon, California, Washington..... Oct. 26-Nov. 3, Incl.

NOTE—Manitoba (on Great Nor., Nor. Pac. and M., St. P. & S. S. M. Rys., also from Winnipeg via Can. Nat'l and Can. Pac. Rys.)

Final honoring date..... Nov. 13, 1935

SOUTHEASTERN PASSENGER ASSOCIATION

Sale dates for points in territory (south of the Ohio and Potomac and east of the Mississippi rivers)..... Oct. 29-Nov. 4, Incl.

Final honoring date..... Nov. 13, 1935

NEW ENGLAND PASSENGER ASSOCIATION

Sale dates for points in territory (New England)..... Oct. 28-Nov. 3, Incl.

Final honoring date..... Nov. 13, 1935

SOUTHWESTERN PASSENGER ASSOCIATION

Sale dates for Oklahoma, Texas..... Oct. 28-Nov. 3, Incl.

Arkansas, Kansas, Louisiana, Missouri, also Memphis, Tenn., and Natchez, Miss..... Oct. 29-Nov. 4, Incl.

Final honoring date..... Nov. 13, 1935

CENTRAL PASSENGER ASSOCIATION AND TRUNK LINE ASSOCIATION

Sale dates for points in territory (east of and including Chicago and St. Louis, north of the Ohio and Potomac rivers to the Atlantic Seaboard, south of New England and Canada)..... Oct. 29-Nov. 4, Incl.

Final honoring date..... Nov. 13, 1935

CANADIAN PASSENGER ASSOCIATION

Sale dates from British Columbia..... Oct. 31-Nov. 6, Incl.

From Alberta..... Oct. 31-Nov. 6, Incl.

From Saskatchewan, Manitoba and Ontario (West of Port Arthur and Armstrong)..... Oct. 31-Nov. 6, Incl.

Final honoring date..... Nov. 13, 1935

VALIDATING DATES NOV. 5-8

AMERICAN DENTAL ASSOCIATION

New Orleans, La. November 4-8, 1935.

HOTEL RESERVATION

In securing hotel reservations for the 1935 Session, consult the hotel rate-sheet and fill out the blank application below. Mail immediately to the hotel you wish to patronize. The hotel will then advise you of the reservation which has been made for you.

In case your first choice cannot be made, kindly indicate second and third choices. If none of your choices are available, the hotel manager will mail your application to the Chairman of Halls & Hotels Committee, who will make as favorable reservation for you as possible.

Please remember that a reservation constitutes a contract with the hotel to provide you with the accommodations you desire. If you find it impossible to carry out your part of the contract, namely, to occupy the room at the time agreed on, please write or wire the hotel, releasing the room reserved for you in order that it may be available to others attending the meeting.

MAIL THIS APPLICATION DIRECT TO THE HOTEL

HOTEL RESERVATION

AMERICAN DENTAL ASSOCIATION, NEW ORLEANS, LA., NOVEMBER 4-8, 1935.

.....Hotel.
New Orleans, La.
Please reserve sleeping accommodations as noted below:

.....Room (s) With bath for.....people. Rate desired per day $.....

.....Room (s) Without bath for.....people. Rate desired per day $.....

Second choice hotel..... Third choice hotel.....

ROOMS TO BE OCCUPIED BY:	ADDRESS IN FULL
Applicant.....	.....
.....	.....
.....	.....
.....	.....

Please confirm this reservation to applicant. I further agree to notify the hotel at once in the event I am unable to use this reservation.

IMPORTANT TO HOTEL MANAGER: In the event you cannot accept this reservation, please forward this application at once to Dr. G. O. Rosado, Chairman Halls & Hotels Committee, 827 Maison Blanche, New Orleans, La., who will attend to the assignment of this reservation.

HOTEL	WITH BATH		
	One Person	Two Persons	Twin Beds
Bienville Hotel Lee Circle	$2.00–2.50 3.00–3.50	$3.50–4.00 5.00	$5.00–6.00 7.00
De Soto Hotel 420 Baronne Street	2.00–2.50 3.00–3.50 4.00	3.50–4.00 4.50–5.00	5.00–6.00 7.00
Jung Hotel 1500 Canal Street	2.50–3.00 3.50–4.00	5.00–6.00	6.00–7.00 8.00
La Salle Hotel 113 Canal Street	2.00–2.50 3.00	3.50–4.00 5.00	5.00–6.00
Hotel Monteleone 214 Royal Street	2.50–3.00 3.50–4.00	5.00–6.00	6.00–7.00 8.00
Hotel New Orleans 1300 Canal Street	2.00–2.50 3.00–3.50	3.50–4.00 5.00	5.00–6.00
Pontchartrain Apt. Hotel 2031 St. Charles Avenue		5.00–6.00	
Roosevelt Hotel 123 Baronne Street	3.00–3.50 4.00–4.50 5.00–6.00	5.00–6.00 7.00	7.00–8.00 9.00
St. Charles Hotel 211 St. Charles Street	2.50–3.00 3.50–4.00 4.50–5.00	4.50–5.00 6.00–6.50	6.00–7.00 8.00

DIRECTORY OF COMMERCIAL EXHIBITORS

Abbott Laboratories, North Chicago, Ill. 57, 58
American Cabinet Co., The, Two Rivers, Wis. 104, 105
American Hecolite Denture Corp., Portland, Ore. 88
Antidolor Mfg. Co., Inc., New York City 46, 47

Bakelite Dental Products, Inc., New York City 102, 103
Baker & Co., Inc., Newark, N. J. 56
Bard Parker Co., Inc., Danbury, Conn. 83
Boos Dental Laboratories, Henry P., Minneapolis, Minn. 41
Bosworth Co., Harry J., Chicago, Ill. 49
Burton Mfg. Co., Inc., Chicago, Ill. 59, 60
Butler Co., John O., Chicago, Ill. 71

Castle Co., Wilmot, Rochester, N. Y. 97
Caulk Co., The L. D., Milford, Del. 68, 69
Chicago X-Ray Film & Mount. Co., Chicago, Ill. 100
Church & Dwight Co., Inc., New York City 82
Cleveland Dental Mfg. Co., The, Cleveland, Ohio 76, 77
Coe Laboratories, Inc., Chicago, Ill. 1, 2, 3
Columbia Dental & X-Ray Corp., New York City 48
Columbus Dental Mfg. Co., The, Columbus, Ohio 25, 26, 27
Cook Laboratories, Inc., New York City 46, 47
Corega Chemical Co., Inc., Cleveland, Ohio 75
Crescent Dental Mfg. Co., Chicago, Ill. 79

Davidson Dental Supply Co., Inc., New Orleans, La. 98
Dee & Co., Thomas J., Chicago, Ill. 66, 67
Dental Plastics Company, Los Angeles, Calif. 39
Dentists' Supply Co. of New York, New York City 33-38
Detroit Dental Mfg. Co., Detroit, Mich. 62, 63
Dudley Research Corp., New York City 28

Eastman Kodak Co., Rochester, N. Y. 24
Enamodent Laboratories, Inc., Portland, Ore. 88

Fischer & Co., Inc., H. G., Chicago, Ill. 87

General Electric X-Ray Corp., Chicago, Ill. 92-95
Goldsmith Bros. Smelting & Refining Co., Chicago, Ill. 96

Hanau Engineering Co., Inc., Buffalo, N. Y. 90
Heidbrink Co., The, Minneapolis, Minn. 80
Horlick's Malted Milk Corp., Racine, Wis. 65
Hu-Friedy Mfg. Co., Chicago, Ill. 55

Iodent Chemical Co., Inc., Detroit, Mich. 89

Jelenko & Co., Inc., J. F., New York City 74
Johnson & Johnson, New Brunswick, N. J. 64

Kile Specialty Co., Hutchinson, Kan. 31

Lea and Febiger, Philadelphia, Pa. 89

Martin Rubber Co., Inc., Long Island City, N. Y. 85
McKesson Appliance Co., Toledo, Ohio 52
Minimax Co., The, Chicago, Ill. 86
Mizzy, Inc., New York City 61
Mosby Co., The C. V., St. Louis, Mo. 84
Moyer Co., Inc., The J. Bird, Philadelphia, Pa. 91

Ney Co., The J. M., Hartford, Conn. 53, 54
Novocol Chemical Mfg. Co., Inc., Brooklyn, N. Y. 42, 43

Pycopé, Incorporated, Joplin, Mo. 32

Ransom & Randolph Co., The, Toledo, Ohio 50
Reliance Dental Mfg. Co., Chicago, Ill. 51
Ritter Dental Mfg. Co., Inc., Rochester, N. Y. 17-22

Spyco Smelting & Refining Co., Minneapolis, Minn. 81
Squibb & Sons, E. R., New York City 72, 73
Stehley, Inc., Philadelphia, Pa. 23
Stern Co., Inc., I., New York City 70

Universal Dental Co., Philadelphia, Pa. 44, 45

Vitex Laboratories, Inc., Harrison, N. J. 4, 5, 6

Weber Dental Mfg. Co., Canton, Ohio 29, 30
Wernet Dental Mfg. Co., Brooklyn, N. Y. 78
White Dental Mfg. Co., The S. S., Philadelphia, Pa. 7-14
Williams Gold Refining Co., Inc., The, Buffalo, N. Y. 16

Young Dental Mfg. Co., St. Louis, Mo. 40

MEMBERS OF THE HOUSE OF DELEGATES 1935

DELEGATES AND ALTERNATES

ALABAMA

Delegates
Olin Kirkland, Shepherd Bldg., Montgomery
C. B. Bray, 2121 Highland Ave., Birmingham
H. Clay Hassell, Tuscaloosa

Alternates
B. F. Sapienza, Comer Bldg., Birmingham
A. B. Horn, First Nat'l Bank Bldg., Montgomery
C. L. F. Haggard, Gadsden

ARIZONA

ARKANSAS

Delegates
C. C. Thompson, De Queen
I. N. Sternberg, Merchants Nat'l Bank Bldg., Fort Smith

Alternates
Rowe Smith, State Nat'l Bank Bldg., Texarkana
J. D. Jordan, Boyle Bldg., Little Rock

CALIFORNIA STATE

Delegates
Arthur R. McDowell, 344 14th St., San Francisco
John E. Gurley, 350 Post St., San Francisco
Sanford M. Moose, 450 Sutter St., San Francisco
Wilfred H. Robinson, 1706 Broadway, Oakland
Lon T. Smith, American Trust Bldg., San Jose
Kenneth I. Nesbitt, 450 Sutter St., San Francisco
Robert F. Thayer, 1736 Franklin St., Oakland
William B. Ryder, Jr., 2000 Van Ness Ave., San Francisco

Alternates
T. Leslie Brown, 2241 Center St., Alameda
Hermann Becks, U. C. Hooper Foundation, San Francisco
Charles A. Sweet, 242 Moss Ave., Oakland
Lester A. High, 1624 Franklin St., Oakland
Don J. Aubertine, 291 Geary St., San Francisco
George A. Selleck, 450 Sutter St., San Francisco
James Allen Graham, 209 Post St., San Francisco
B. C. Kingsbury, 490 Post St., San Francisco

SOUTHERN CALIFORNIA

Delegates
Fred B. Olds, 1152 Roosevelt Bldg., Los Angeles
W. S. Thompson, 727 W. 7th St., Los Angeles
Charles H. Alter, Investment Bldg., Pomona
J. P. Buckley, 803 Taft Bldg., Hollywood
J. C. Roberts, 706 Brockman Bldg., Los Angeles
Guy Van Buskirk, 1930 Wilshire Blvd., Los Angeles
Bert Boyd, Story Bldg., Los Angeles
Harry R. Hancock, 1836 State St., Santa Barbara
Frank S. Kaiser, 727 W. 7th St., Los Angeles

Alternates
Carl D. Lucas, Brockman Bldg., Los Angeles
Nye W. Goodman, Story Bldg., Los Angeles
B. B. McCollum, 1052 W. 6th St., Los Angeles
Arthur E. Smith, Wilshire Medical Bldg., Los Angeles
Carl L. Moller, Pacific Mutual Bldg., Los Angeles
A. Laurence Dunn, 1836 State St., Santa Barbara
H. C. Peisch, 65 N. Madison Ave., Pasadena
Ben L. Reese, 727 W. 7th St., Los Angeles
J. K. Williams, 1052 W. 6th St., Los Angeles

COLORADO

Delegates
L. W. Johnston, Republic Bldg., Denver
Ira C. Brownlie, Metropolitan Bldg., Denver
Ralph R. Gibson, Republic Bldg., Denver

Alternates
E. R. Warner, Metropolitan Bldg., Denver
E. F. Warren, Republic Bldg., Denver
B. H. Downs, Exchange Nat'l Bank Bldg., Colorado Springs

CONNECTICUT

Delegates
J. D. Hertz, 46 Bedford St., Stamford
J. A. Bray, 99 Pratt St., Hartford
C. W. Vivian, 58 Elbridge Rd., New Britain
C. E. Peterson, 34 Park Place, Rockville
A. B. Rosoff, 265 Church St., New Haven

Alternates
W. B. Brewster, 111 W. Main St., Waterbury
J. Otis Miner, 48 Main St., New London
Henry Hicks, 3 Glen Court, Greenwich
J. J. Myers, 1115 Main St., Bridgeport
W. J. Murray, 74 State St., New London

DELAWARE

Delegate
Philip A. Traynor, 807 Washington St., Wilmington

Alternate
J. Draper Brown, 10th & Madison Sts., Wilmington

DISTRICT OF COLUMBIA

Delegates
Charles D. Cole, 1835 Eye St., N. W., Washington
Robert L. Eller, 1624 Eye St., N. W., Washington
J. F. Brazinsky, 1029 Vermont Ave., N. W., Washington

Alternates
Henry A. Swanson, 1726 Eye St., N. W., Washington
F. J. Hess, Farragut Medical Bldg., Washington
A. D. Weakley, 1029 Vermont Ave., N. W., Washington

FLORIDA

Delegates
J. E. Chace, Ocala
C. J. Caraballo, Stovall Bldg., Tampa
C. P. Cleveland, St. James Bldg., Jacksonville

Alternates
B. V. Dannheisser, Brent Bldg., Pensacola
J. Murry Cox, Huntington Bldg., Miami
R. D. Cummins, West Coast Title Bldg., St. Petersburg

GEORGIA

Delegates
Carl Betts, Rome
R. F. Sullivan, Savannah
A. A. Lawry, Valdosta

Alternates
William Weichselbaum, Savannah
Witherspoon Wallace, Medical Arts Bldg., Atlanta
W. H. Banks, Montezuma

HAWAII

IDAHO

Delegate
E. F. Seibert, Boise

Alternate
R. A. Johnson, Nampa

IOWA

Delegates
John Scholten, Dows Bldg., Cedar Rapids
Mort Henkin, New Orpheum Bldg., Sioux City
Roscoe D. Feldman, Ames
C. G. Sanner, B. & I. Bldg., Dubuque
C. T. Brann, First Nat'l Bank Bldg., Davenport
Hardy F. Pool, M. B. A. Bldg., Mason City

Alternates
C. V. Watts, K. of P. Bldg., Des Moines
A. W. Bryan, College of Dentistry, Iowa City
H. J. Altfillisch, Roshek Bldg., Dubuque
R. J. Carroll, Pioneer Nat'l Bank Bldg., Waterloo
Raymond F. Kunz, I.O.O.F. Bldg., Mason City
L. W. Lewis, Shenandoah

ILLINOIS

Delegates
P. B. D. Idler, 55 E. Washington St., Chicago
W. A. McKee, Benton
B. H. Sherrard, Rock Island Bank Bldg., Rock Island
B. O. Sippy, 30 N. Michigan Ave., Chicago
A. B. Patterson, Morris Bldg., Joliet
E. P. Boulger, 17 S. Crawford Ave., Chicago
D. W. Adams, 185 N. Wabash Ave., Chicago
F. A. Neuhoff, First Nat'l Bank Bldg., Belleville
W. Ira Williams, 122 S. Michigan Ave., Chicago
W. J. Bray, 185 N. Wabash Ave., Chicago
R. H. Daniels, Lehmann Bldg., Peoria
G. W. Hax, 8 S. Michigan Ave., Chicago
H. S. Layman, Ridgely-Farmers Bank Bldg., Springfield
R. W. McNulty, 460 Prospect Ave., Elmhurst
S. D. Tylman, 185 N. Wabash Ave., Chicago
Z. W. Moss, Dixon
E. F. Koetters, W.C.U. Bldg., Quincy
J. J. Griffin, Citizens Bldg., Decatur

Alternates
H. W. Oppice, 1002 Wilson Ave., Chicago
W. H. G. Logan, 55 E. Washington St., Chicago
L. E. Coonradt, Gushard Bldg., Decatur
E. D. Coolidge, 25 E. Washington St., Chicago
J. J. Corlew, Mt. Vernon
E. L. Aison, 55 E. Washington St., Chicago
P. W. Clopper, 3030 S. Adams St., Peoria
E. E. Graham, 58 E. Washington St., Chicago
F. E. Ebert, Co-op. Bldg., Champaign
R. G. Kesel, 1838 W. Washington St., Chicago
Homer Peer, First Nat'l Bank Bldg., Urbana
J. C. Heighway, Central Life Bldg., Ottawa
R. H. Johnson, 1608 W. Madison St., Chicago
T. E. Turner, 25 E. Washington St., Chicago
W. J. Gonwa, Chrisman
N. D. Vedder, Carrollton
H. I. Michener, 1719 W. Chicago Ave., Chicago
C. L. Daniels, 658 Downer Place, Aurora

INDIANA

Delegates
E. L. Mitchell, Hume-Mansur Bldg., Indianapolis
A. L. Harter, Kokomo
R. N. Douglas, 506 S. Second St., Elkhart
R. R. Gillis, 134 Rimbach St., Hammond
V. H. Knapp, Citizens Bank Bldg., Evansville
E. E. Voyles, Odd Fellows Bldg., Indianapolis

Alternates
J. B. Carr, Hume-Mansur Bldg., Indianapolis
William Bogie, 214 Main St., Vincennes
F. Wade LaRue, Medical Arts Bldg., Indianapolis
Fred E. Houck, Huntington
F. R. Henshaw, Medical Arts Bldg., Indianapolis
E. T. Haynes, Bankers Trust Bldg., Indianapolis

KANSAS

Delegates
George E. Burkett, Courier Blk., Kingman
H. B. Robison, Rorabaugh Wiley Bldg., Hutchinson
Fred A. Richmond, Federal Reserve Life Bldg., Kansas City
A. J. Buff, Mills Bldg., Topeka

Alternates
J. Burtch Stevens, Rorabaugh-Wiley Bldg., Hutchinson
John W. Richmond, Federal Reserve Bldg., Kansas City
Glenn E. Tilton, Union Nat'l Bank Bldg., Wichita
J. Scott Walker, Chetopa

KENTUCKY

Delegates
V. A. Stilley, Jr., City Nat'l Bank Bldg., Paducah
E. C. Hume, Heyburn Bldg., Louisville
J. B. Juett, Fayette Bank Bldg., Lexington

Alternates
W. R. Atkins, Starks Bldg., Louisville
R. P. Thomas, Heyburn Bldg., Louisville
J. F. Owen, Fayette Bank Bldg., Lexington

LOUISIANA

Delegates
Frank S. Oser, Audubon Bldg., New Orleans
L. P. Laville, Plaquemine
S. B. Robinson, Weber Bldg., Lake Charles

Alternates
Malcolm E. Kaffie, Medical Arts Bldg., Shreveport
Nathan G. Gaston, Bernhardt Bldg., Monroe
Norbert E. Perret, Jeanerette

MAINE

Delegates
Alton H. Swett, 192 State St., Portland
Carl W. Maxfield, 31 Central St., Bangor

Alternates
John C. Seidel, 142 High St., Portland
Fred E. Maxfield, 31 Central St., Bangor

MARYLAND

Delegates
J. Ben Robinson, Medical Arts Bldg., Baltimore
E. W. Swinehart, Medical Arts Bldg., Baltimore
Thomas S. Eader, Frederich

Alternates
R. C. Leonard, 2411 N. Charles St., Baltimore
H. H. Street, 819 Park Ave., Baltimore
M. S. Aisenberg, 2029 Eutaw Place, Baltimore

MASSACHUSETTS

Delegates
Charles E. B. Chase, 29 Commonwealth Ave., Boston

Philip E. Adams, 106 Marlborough St., Boston
Amos I. Hadley, 29 Commonwealth Ave., Boston
Paul J. McKenna, 69 Chestnut St., Springfield
Frank P. Barnard, 507 Main St., Worcester
Howard M. Majerison, 29 Commonwealth Ave., Boston
Harold W. Alden, 160 Main St., Northampton
William H. Gilpatric, 358 Commonwealth Ave., Boston

Alternates
John G. Goodridge, 77 Broad St., Lynn
James H. Maycock, Gardner State Colony, E. Gardner
George Cowles Brown, 332 Main St., Worcester
Norman B. Nesbett, 106 Concord Ave., Belmont
Charles P. Fortin, 340 Court St., New Bedford
Harold E. Tingley, 12 Bay State Road, Boston
Harold J. Cronin, 739 Liberty St., Springfield
Mark D. Elliott, 140 The Fenway, Boston

MICHIGAN

Delegates
Harry F. Parks, Reynolds Bldg., Jackson
M. Webster Prince, 7634 Dexter Blvd., Detroit
William F. Northrup, Stroh Bldg., Detroit
U. Garfield Rickert, School of Dentistry, University of Michigan, Ann Arbor
William R. Davis, Michigan Department of Health, Lansing
E. J. Chamberlain, Ashton Bldg., Grand Rapids
E. B. Spalding, 555 Maple Ave., W., Birmingham
J. Orton Goodsell, Second Nat'l Bank Bldg., Saginaw

Alternates
Paul H. Jeserich, 721 N. University Ave., Ann Arbor
Oliver W. White, David Whitney Bldg., Detroit
P. C. Lowery, 8545 Gratiot Ave., Detroit
C. J. Wright, American State Bank Bldg., Lansing
Willa Yeretsky, Medical Arts Bldg., Grand Rapids
Lewis F. Hooper, 114 Maple St., Wyandotte
Charles H. Jamieson, 8545 Gratiot Ave., Detroit
Stanley C. Lucas, Fisher Bldg., Detroit

MINNESOTA

Delegates
M. H. Thornton, Selby & Snelling Aves., St. Paul
V. D. Irwin, Medical Arts Bldg., Duluth
M. E. Ernst, Lowry Medical Arts Bldg., St. Paul
Harry W. Nelson, Medical Arts Bldg., Minneapolis
G. R. Metcalf, Barnesville
C. E. Rudolph, Metropolitan Bank Bldg., Minneapolis
C. L. Perrizo, Jasper
Charles L. Nelson, Box 157, Fergus Falls

Alternates
William J. Von Bank, New Ulm
Carl O. Flagstad, Medical Arts Bldg., Minneapolis
M. M. Van Campen, Barnesville
A. R. Schmid, Worthington
H. L. Harris, Lowry Medical Arts Bldg., St. Paul
E. A. Rieke, Lowry Medical Arts Bldg., St. Paul
Joseph B. Towey, Medical Arts Bldg., Minneapolis
L. M. Cruttenden, Lowry Medical Arts Bldg., St. Paul

MISSISSIPPI

Delegates
A. S. Hopkins, Gulfport
R. P. Abbott, West Point

Alternates
C. M. Wells, Canton
A. J. Price, Gulfport

MISSOURI

Delegates
H. C. Pollock, 4482 Washington St., St. Louis
O. W. Brandhorst, 4500 Olive St., St. Louis
Harry Allshouse, 6247 Brookside Blvd, Kansas City
R. J. Rinehart, Kansas City-Western Dental School, Kansas City
L. R. Main, Metropolitan Bldg., St. Louis
C. A. Noland, Monroe City

Alternates
R. B. Owen, Frisco Bldg., St. Louis
O. A. Kelly, University Club Bldg., St. Louis
R. W. Parmenter, 31st St. & Troost Ave., Kansas City
Walter C. Shull, 63rd & Brookside Blvd., Kansas City
L. B. Wright, Paul Brown Bldg., St. Louis
W. T. Rutledge, Monroe City

MONTANA

Delegates
F. L. Casey, Polson
R. E. Ramaker, Missoula

Alternates
V. V. Crissey, Philipsburg
C. D. Beveridge, Billings

NEBRASKA

Delegates
E. H. Bruening, City Nat'l Bank Bldg., Omaha
H. E. King, Insurance Bldg., Omaha
F. A. Pierson, Federal Securities Bldg., Lincoln
F. F. Whitcomb, Medical Arts Bldg., Omaha

Alternates
E. A. Thomas, Hastings
F. W. Leonard, Columbus
I. E. Larson, Adams
F. A. Litchfield, Medical Arts Bldg., Omaha

NEW HAMPSHIRE

Delegate
F. E. Williams, Manchester

Alternate
H. DeWitt Cross, Nashua

NEW JERSEY

Delegates
Walter A. Schilke, 44 E. Palisade Ave., Englewood
Kenneth C. Pruden, 44 Church St., Paterson
John S. Owens, 109 N. Fifth St., Camden
E. J. H. Schneider, 519 Prospect St., Maplewood
George H. Martin, 921 Bergen Ave., Jersey City
Frederick H. Lum, Jr., 151 Main St., Chatham
Eugene W. Roberts, 627 Haddon Ave., Collingswood
George H. Grim, 695 Bergen Ave., Jersey City
Joseph R. Walsh, 67 S. Clinton St., East Orange

Alternates
Frank J. Houghton, 921 Bergen Ave., Jersey City
Walter A. Wilson, 28-32 Duncan Ave., Jersey City
P. Conner Hulse, 600 Highland Ave., Palmyra
I. Weinmann, 134 Branford Place, Newark
Charles Faupel, 484 Bergen Ave., Jersey City
Craft A. Hopper, 534 Broadway, Paterson
E. L. D. Hester, 34 E. Palisade Ave., Englewood
J. M. Wisan, 1143 E. Jersey St, Elizabeth
E. J. Jennings, 126 W. State St., Trenton

NEVADA

NEW MEXICO

NEW YORK

Delegates

Fred R. Adams, 80 W. 40th St., New York City
Theodor Blum, 101 E. 79th St., New York City
J. A. Burgun, 184 Joralemon St., Brooklyn
H. J. Burkhart, P. O. Box 879, Rochester
G. G. Burns, Professional Bldg., Rochester
Oscar J. Chase, Jr., 140 E. 54th St., New York City
Waite A. Cotton, 241 W. 71st St., New York City
Joseph F. Howard, Cortland
L. C. Howes, 468 Delaware Ave., Buffalo
Daniel E. Hurley, 80 Fourth St., Troy
F. W. MacDonald, 20 E. 57th St., New York City
W. L. MacDonell, Mayro Bldg., Utica
Edward F. Mimmack, 206 Bryant St., Buffalo
E. B. Rhinehart, 617 Union St., Schenectady
D. A. Sniffen, 121 Westchester Ave., White Plains
Albert W. Twiggar, 168 Main St., Ossining
Alfred Walker, 501 Madison Ave., New York City
C. Raymond Wells, 1 DeKalb Ave., Brooklyn
Paul W. Zillman, 29 Walden Ave., Buffalo
Clyde M. Gearhart, 17 Park Ave., New York City

Alternates

Elmer F. Bay, 405 N. Main St., Jamestown
Phillip Back, 237 Willis Ave., New York City
F. H. Brophy, 200 W. 59th St., New York City
Walter F. Chapelle, 333 Linwood Ave., Buffalo
Philip R. Courten, 8906 163rd St., Jamaica
Walter E. Fancher, 272 S. Broadway, Yonkers
Willard A. Gray, Medical Arts Bldg., Rochester
George A. Hall, Main St., Geneseo
L. E. Kay, 1503 Main St., Niagara Falls
J. A. Kirkland, 509 Willis Ave., New York City
Leonard Kohn, 332 New York Ave., Brooklyn
A. S. Litten, 230 Central Park W., New York City
Henry C. McBrair, Middletown
P. C. Maier, 1313 State St., Schenectady
J. L. O'Connor, Temple Theatre Bldg., Syracuse
H. A. Peterson, Snyder Bldg., Elmira
Simon Shapiro, 142 Joralemon St., Brooklyn
William A. Fennelly, 21 E. 40th St., New York City
H. G. Kittell, 620 Second Ave., Troy
R. W. Tench, 116 W. 59th St., New York City

NORTH CAROLINA

Delegates

Wilbert Jackson, Clinton
J. Martin Fleming, Citizens Bank Bldg., Raleigh
H. O. Lineberger, Raleigh

Alternates

J. N. Johnson, Goldsboro
Paul E. Jones, Box 662, Farmville
R. M. Olive, Fayetteville

NORTH DAKOTA

Delegates

Albert Hallenberg, Black Bldg., Fargo
Victor E. Sandberg, Minot

Alternates

C. F. Sweet, Minot
L. C. Andersen, Jamestown

OHIO

Delegates

F. M. Pursell, Second Nat'l Bldg., Akron
J. V. Gentilly, Rose Bldg., Cleveland
P. J. Aufderheide, Rose Bldg., Cleveland
Harry Cope, 327 E. State St., Columbus
J. F. Stephan, Keith Bldg., Cleveland
A. J. Bush, 683 E. Broad St., Columbus
T. L. Way, Doctors Bldg., Cincinnati
C. W. Mills, Chillicothe
D. P. Snyder, 137 E. State St., Columbus

Alternates

C. J. Stark, Keith Bldg., Cleveland
J. W. Travis, 2679 Monroe St., Toledo
W. I. Jones, 327 E. State St., Columbus
W. J. Pryor, Rose Bldg., Cleveland
V. B. Dalton, 116 Garfield Place, Cincinnati
E. L. Ball, Doctors Bldg., Cincinnati
E. V. Burns, Findlay
H. J. Hoppe, 4183 Pearl Road, Cleveland
C. H. Schott, Neave Bldg., Cincinnati

OKLAHOMA

Delegates

A. L. Walters, Medical Arts Bldg., Tulsa
A. E. Bonnell, Surety Bldg., Muskogee
F. J. Reichmann, Medical Arts Bldg., Oklahoma City

Alternates

O. F. Sinks, Medical Arts Bldg., Tulsa
G. A. Roelke, Medical Arts Bldg., Tulsa
E. L. Miley, Ramsey Tower, Oklahoma City

OREGON

Delegates

H. W. Titus, Miner Bldg., Eugene
H. C. Fixott, Medical-Dental Bldg., Portland

Alternates

A. P. Watson, Medical-Dental Bldg., Portland
A. F. Weeks, Selling Bldg., Portland

PANAMA

Delegate

Vern Prier, Cristobal, Canal Zone

Alternate

Julio Boyd, Panama, R. P.

PENNSYLVANIA

Delegates

F. S. Rusca, 3943 Chestnut St., Philadelphia
G. A. Coleman, 235 S. 15th St., Philadelphia
Walter E. Lotz, Masonic Bldg., Tyrone
Thomas P. Fox, 1614 Locust St., Philadelphia
Harry C. Metz, Highland Bldg., Pittsburgh
P. V. McParland, Medical Arts Bldg., Pittsburgh
H. E. Diesell, University of Pittsburgh, Pittsburgh
Fred D. Miller, 1122 12th Ave., Altoona
Walter E. Mendel, 405 Ohio St., Pittsburgh
C. Barton Addie, Central Medical Bldg., Philadelphia
R. E. Denny, Medical Arts Bldg., Philadelphia
W. Paul Walker, Peoples East End Bldg., Pittsburgh
John H. Corcoran, Scranton Life Bldg., Scranton
W. A. McCready, Highland Bldg., Pittsburgh
W. J. Robinson, 4906 Walnut St., Philadelphia
A. C. Young, 121 University Place, Pittsburgh
W. Harry Archer, May Bldg., Pittsburgh

Alternates

Albert I. Wise, Aronson Bldg., Pittsburgh
J. C. G. Fitzhugh, Masonic Bldg., McKeesport
Harry A. Mesjian, 3922 Chestnut St., Philadelphia
J. T. O'Leary, Connellsville
J. H. Harrison, Seager Bldg., Hazleton
G. C. Tassman, Medical Arts Bldg., Philadelphia
William G. Pfeffer, 310 Fourth St., Altoona
A. S. Lawson, 524 Federal St., Pittsburgh
C. S. Harkins, 222 Curtin St., Osceola Mills
O. J. Specker, 230 N. Fifth St., Reading

Paul Matusavage, 97 W. Main St., Glen Lyon
V. E. Schermerhorn, Hooker-Fulton Bldg., Bradford
S. I. Roseman, 5519 N. Fifth St., Philadelphia

PHILIPPINE ISLANDS

PUERTO RICO

Delegate
J. Fernandez Carballo, Edificio Padin, San Juan

Alternate
Carlos F. Maristany, Ponce

RHODE ISLAND

SOUTH CAROLINA

Delegates
W. R. Craig, Walhalla
George W. Dick, Sumter

Alternates
George C. Albright, Professional Bldg., Greenville
A. J. Beadenbough, 1515 Main St., Columbia
E. G. Bumgardner, Medical Bldg., Columbia

SOUTH DAKOTA

Delegates
E. W. Elmen, Sioux Falls
Glee Tarbell, Watertown

Alternates
C. K. Walker, Huron
P. L. Scofield, De Smet

TENNESSEE

Delegates
T. E. Braly, Volunteer State Life Bldg., Chattanooga
W. W. Oursler, 915 Madison Ave., Memphis
Roy Elam, Medical Arts Bldg., Nashville
Claude R. Wood, Medical Arts Bldg., Knoxville

Alternates
D. P. Houston, First Nat'l Bank Bldg., Chattanooga
J. Frank Bigger, Medical Arts Bldg., Memphis
H. A. Graves, Doctors Bldg., Nashville
W. B. Clotworthy, Medical Arts Bldg., Knoxville

TEXAS

Delegates
W. H. Scherer, Medical Arts Bldg., Houston
D. C. McRimmon, Medical Arts Bldg., Fort Worth
S. Van Wie, Nix Professional Bldg., San Antonio
W. P. Delafield, Medical Arts Bldg., Dallas
Stuart E. Hays, Medical Arts Bldg., San Antonio
E. L. Knox, Medical Arts Bldg., Dallas

Alternates
J. A. Hall, Shamrock
J. F. Clark, San Jacinto Life Bldg., Beaumont
J. O. Hall, 508 N. 15th St., Waco
F. M. Hight, Medical Arts Bldg., Houston
W. O. Talbot, Trinity Life Bldg., Fort Worth
Otis L. Swepston, Medical Arts Bldg., Dallas

UTAH

VERMONT

Delegate
Howard F. Killary, Burlington

VIRGINIA

Delegates
W. N. Hodgkin, Warrentown
Harry Bear, Professional Bldg., Richmond
N. F. Muir, Shenandoah Life Bldg., Roanoke

Alternates
N. Talley Ballou, State Board of Health, Richmond
T. Wood Campbell, Suffolk
J. E. John, Medical Arts Bldg., Roanoke

WASHINGTON

WEST VIRGINIA

Delegates
R. H. Rudolph, Parkersburg
J. B. Poindexter, Professional Bldg., Huntington
H. E. Summers, First Nat'l Bank Bldg., Huntington

Alternates
L. D. Cleek, Bartley
D. E. Gallagher, Parkersburg
W. J. Boydston, Fairmont

WISCONSIN

Delegates
G. E. Morgan, 2309 N. Prospect Ave., Milwaukee
A. C. Rohde, 1229 Wells Bldg., Milwaukee
T. A. Hardgrove, 104 S. Main St., Fond du Lac
G. A. Le Sage, 1320 Tower Ave., Superior
F. A. Bull, 1134 W. State St., Milwaukee
R. W. Huegel, Tenney Bldg., Madison
F. J. Martin, Medford

Alternates
E. D. Calkins, Arcade Bldg., Racine
J. M. Donovan, Neenah
J. A. Frey, 404 Third St., Wausau
W. G. Morrisey, Reedsville
C. J. Baumann, 2560 S. Kinnickinnic Ave., Milwaukee
Earl Doyle, 318 South St., Waukesha
C. F. Clark, Menomonie

WYOMING

Delegate
William H. Andrew, Boyd Bldg., Cheyenne

Alternate
Earl C. Andrew, Hynds Bldg., Cheyenne

ARMY

Delegate
F. L. K. Laflamme, Fort Sam Houston, Texas

Alternate
Avery G. Holmes, DC Army & Navy Gen'l Hosp., Hot Springs Nat'l Park, Ark.

NAVY

Delegate
Clem V. Rault, DC U. S. Navy, Bureau of Med. & Surg., Navy Dept., Washington, D. C.

Alternate
Francis G. Ulen, DC U. S. Navy, U. S. Navy Academy, Annapolis, Md.

U. S. PUBLIC HEALTH SERVICE

Delegate
C. T. Messner, U. S. Public Health Service, Washington, D. C.

Alternate
F. C. Cady, U. S. Public Health, Service Washington, D. C.

U. S. VETERANS BUREAU

Delegate
Lloyd Y. Beers, U. S. Veterans Administration, Washington, D. C.

Alternate
Adolph E. Grau, U. S. Veterans Bureau, 333 St. Charles St., New Orleans, La.

CURRENT LITERATURE

Graded Course in Medicine as Part of Dental Curriculum (L. H. Collins, Jr., M. P. Crane and B. I. Comroe, J.A.M.A., 105:660 [Aug. 31] 1935): Courses in internal medicine are given to the dental students at the University of Pennsylvania as a means of furnishing the future dental practitioner with the idea that "he should know at least the working vocabulary of the science and practice of internal medicine." During the second year, weekly lectures are given, to introduce the major concepts of modern internal medicine. Bi-weekly clinics during the third year illustrate the general characteristics of the commoner disorders and serve to reemphasize the basic facts gained in the previous year. In the fourth year, groups of about eight students meet with members of the medical and dental faculties to discuss selected patients, amplifying the dentomedical correlationships. Quizzes and examinations are held during the second and third years and a comprehensive oral examination at the end of the fourth year. After only two years, a closer relationship is being noted between the medical and dental faculties in exchange of ideas and in clinical and investigative work.

HAMILTON ROBINSON.

Carcinoma of the Mouth—with Special Reference to Treatment (Radiology, 25:24 [July] 1935): Cancer of the mouth, although among the most accessible types of tumor, ranks in frequency second to that of the breast and uterus and has a mortality rate of from 75 to 90 per cent. The lip, tongue, floor of the mouth and cheek are the sites most frequently involved. Of the malignant tumors of the mouth, epidermoid carcinomas, usually of the adult differentiated type, comprise more than 90 per cent. The basal-cell carcinoma is extremely rare in the mouth. The majority of lesions of the floor of the mouth are localized around the openings of salivary ducts. Mandibular cancer arises from the gingiva, usually beginning around an infected tooth as a warty ulcer or growth with raised everted edges. Mouth cancers are said to be probably due to syphilis, the use of tobacco or alcohol, leukoplakia, defects of the teeth or mouth infection. The lesion is usually a hard indurated ulcer, sometimes more papillary and nodular. Any ulceration of the mouth of more than two weeks' duration should be investigated with cancer in mind. Once cancer invades the cervical nodes, the chance of cure is practically lost. The differential diagnosis is generally very well controlled by the free use of biopsy. Other ulcerations may be due to pressure from teeth or plates, leukemia, agranulocytosis, tuberculosis or actinomycosis. Spread of the disease occurs by direct extension and by metastases. Single cases of implantation in esophageal, gastric and duodenal mucosae and implantation of bronchial nodes by aspiration has been recorded following cancer of the tongue. The local and regional growths may become secondarily infected, necrosis and suppuration, with toxic systemic effects and emaciation, following. The clinical course is progressive, the condition becoming fatal in an average of two years, with death from pneumonia, septicemia, edema of the glottis and hemorrhage. Treatment is with surgery and with radiation, separately or combined. Most therapists use only the hard gamma rays and radon emanations. Limitation should be placed on the importance of grading tumors as an index to prognosis. The entire work is well written and contains the information about recognition and treatment of cancer of the mouth that most dentists need. The accompanying bibliography is unusually long.

G. VAN HUYSEN.

Measurement of p_H and Acid Neutraliz-

ing Power of Saliva (B. Soyemhoff and C. F. Hinch, Jr., J. Biol. Chem., 109:467, 1935): The authors made preliminary p_H determinations on saliva with hydrogen, capillary quinhydrone and MacInnes glass electrodes. The glass electrodes were selected for subsequent work on saliva because the authors found that, in their hands, it was more reliable and gave results that were more readily reproducible. p_H determinations were made on resting and paraffin stimulated saliva. The average p_H values of resting and activated saliva at 37 C. differed by only 0.5 p_H units. The results on p_H of saliva were: resting, 9 cases (13 samples), average 6.64, ranging from 6.37 to 6.89; stimulated, 9 cases (13 samples), average 7.13, ranging from 7.00 to 7.27. Titrimetrically, the authors studied p_H changes of the saliva on the addition of acid and alkali. They found that the saliva acted as a buffer on the alkaline side of p_H 4, and that the acid neutralizing power of saliva decreased markedly between p_H 4 and 2.5. On the alkaline side of p_H 4, most of the hydrogen ions were removed by chemical combination; while on the acid side of p_H 2.5, more than half of the hydrogen ions remained uncombined.

R. E. Brawley.

Epithelioma of the Skin and Mucous Membranes (J. K. Howles, South. Med. J., 28:494 [June] 1935): A review of the developments in the study of cancer is given, followed by a survey of 2,220 epitheliomas collected from the hospital records of twenty-seven years. In the oral mucous membrane and mucocutaneous junction lesions, especially, the squamous cell type grows faster and metastasizes more frequently. Most skin cancers occur in the relatively old, more commonly in men than in women and more commonly in Negroes (in these cases). The lips were the site of 21.9 per cent of the cases, the tongue, 0.004 per cent, and the mouth, 0.0227 per cent. No one therapeutic measure is emphasized by the author, but he prefers a combination of methods. The need for close follow-up is stressed.

Hamilton Robinson.

Systemic Thrush in Childhood (F. W. Schultz, J.A.M.A., 105:650 [Aug. 31] 1935): Contrary to common opinion, thrush is not caused by one species of fungus, *Oidium albicans,* but may be caused by any of a number of different fungi. The dermatophytides, under which common thrush as seen in infants and children is classified, are very resistant to adverse environment and require little oxygen. Beginning from oral lesions, the entire gastro-intestinal tract may be involved, and even the lungs, kidneys and liver may be invaded. Thrush, which is not contagious, may occur at any age and may result fatally. Four cases are cited occurring in 4 month and 4, 6 and 9 year old girls. Two of the cases were accompanied by dwarfing and two by general alopecia.

Hamilton Robinson.

Tuberculosis of Mouth (By B. L. Feuerstein, Am. J. Surg., 29:313 [Aug.] 1935): Feuerstein says that chronic ulcerations of the mouth are usually treated by physician and dentist for cancer even before biopsy has afforded confirmation. Because of this interest in cancer, tuberculous lesions of the mouth which require different treatment may get no consideration. The lesions of the mouth are almost always secondary to pulmonary tuberculosis, but an accompanying difficulty is the patient's ignorance of his lung involvement. Ten case histories are recited. The author summarizes the article as follows: Tuberculosis of the mouth should be considered as a possible diagnosis in chronic oral ulcerations. While always secondary to pulmonary tuberculosis, the lung lesions may give few or no symptoms. Radiation therapy may be of some value in the treatment of these cases.

T.

Dentigerous Cysts of Antrum: Report of Two Cases (Andrew A. Love, Arch. Otolaryn., 19:348 [March] 1934): Love states that the essential etiology of this condition is not known, but probably retention of fluid in the stellate reticulum of the follicle of the tooth that is situated between the cuticular dentin and the crown. The fluid distends the follicle into a cyst lined with

adamantine epithelium. The majority of such cysts develop from unerupted permanent teeth and usually appear between 10 and 30 years of age. Love commends the work of Malassez, who believed that these cysts develop from paradental rests. He remarks that Cohnheim's theory of tumor formation, according to which there must be a matrix of embryonal cells, falls down here, for in this condition there is a displaced matrix of embryonal cells which may be typical and carry out their life function in an abnormal position. Although composed of misplaced epithelium, they do not form malignant growths. He presents a good differential diagnosis, referring to radicular cysts, and concludes that the most successful treatment is complete removal by a radical operation on the antrum.—Abstr., *Am. J. Dis. Child.*, 50:528 (Aug.) 1935.

Oral Immunization to Colds (G. E. Rockwell, H. C. Van Kirk and H. M. Powell, J. Immunology, 28:475 [June] 1935): Rockwell and his collaborators immunized a large group of persons orally to the secondary invaders of colds, using a vaccine made up of heterophile antibodies. The 500 patients who took the vaccine came from various walks of life and the 536 persons used as controls were chosen from the same environment. The average number of colds each patient had annually in the past three years, age, sex, occupation and allergic history was obtained before the vaccine was given. The oral cold vaccine was made from pneumococci and streptococci. Since the desired immunity was a nontype specific heterophile active immunity, a single pneumococcus strain was used. This strain was DR-I, a well known nonpassaged, and mainly rough, variant from the Neufeld type I pneumococcus. The streptococcus was a hemolytic mouse-virulent laboratory strain. The treatment consisted of the ingestion of one capsule of starch adsorbed vaccine containing 100 billion pneumococci and 100 billion streptococci with a half glassful of cold water each morning before breakfast for seven consecutive mornings, after which term one capsule each week was taken throughout the season. Of the 500 treated cases, thirty-eight had a history of continuous colds, while 425 had a history of from one to eight colds annually per person. Among the 536 controls, nine had a history of continuous colds, while 527 had a history of from only one to eight colds annually per person. Among the forty-seven patients who gave a history of continuous colds, the thirty-eight who were given the oral cold vaccine had, for that year, a total of only forty-one colds, thus passing from a stage of continual coryza to an average of 1.08 colds per person, while of the nine persons used as controls, only one reported a less severe type this year. Among those who for the past three years had a history of from one to eight colds annually per person, 462 patients, having a yearly average total during the previous three years of 1,400 colds or 3.03 colds per person annually, while taking the vaccine this year had a total of only 604 colds, or an average of 1.3 colds per person and 1.73 colds less per person, a decrease of 57 per cent. The 527 persons used as controls had a yearly average total, for the past three years, of 1,314 colds, or 2.49 colds per person annually. During the school year 1933-1934 this group had a total of 1,156 colds, or 2.19 colds per person, which is 0.3 cold less per person, or a decrease of 12 per cent. The essential decrease due to the oral cold vaccine is thus 45 per cent. The relationship between the response of the individual to the heterophile antigen and his incidence of colds is given in a separate article.—Abstr. *J.A.M.A.*, 105-835 (Sept. 7) 1935.

Bacteriophage Therapy—Clinical Study, with Special Reference to Technique of Application (By Ralph Lampert and Frederick Fitzherbert Boyce, with Elizabeth M. McFetridge, Am. J. Surg., 29:436 [Sept.] 1935): The authors call attention to the prevailing attitude toward bacteriophage, which ranges from skepticism to disbelief. They present their findings on the fact that the real worth of any therapy is estimated by the results it achieves. The authors give much historical reference and results and add approximately 1,000 cases, 90 per cent of which were successful. They attribute

the results to direct contact of the bacteriophage with the infected tissues in generous daily application. Pain is relieved promptly and the duration of treatment is brief when compared with that of other therapy. The method does no harm when it does not succeed.

T.

Osteomyelitis (By J. J. Kirschenmann, Am. J. Surg., 29:465 [Sept.] 1935): The author reports five cases of osteomyelitis affecting the humerus, ulna, phalanges, tibia and toe, in which he used a mixed stock bacteriophage without respect to the causative organism. The treatment was to incise, evacuate the pus and inject the phage. An injection was given every second or third day until the discharge stopped. The average disability in affections of the phalanges was fifty-six days from the beginning of treatment to the patient's return to work. The shortest disability was twenty-four days and the longest 142 days. In the treatment of six cases of finger infection, no finger was amputated and no case was hospitalized.

T.

Oral Manifestations of Bismuth (F. P. McCarthy and S. O. Dexter, Jr., New England J. Med., 213:345 [Aug. 22] 1935): Since 1922, bismuth has become second only to the arsenicals in the treatment of syphilis and has almost displaced mercury. Its mode of action is undetermined, but spirochetes disappear with its use. Bismuth is less injurious than arsenic or mercury, but is far from innocuous. The study presented is based on a series of 511 patients of the Skin Out-Patient Department Clinic of the Boston City Hospital. The mouth was examined for the presence of bismuth pigmentation, the condition of the gums and teeth and general oral hygiene. The bismuth preparation used was the suspension of the insoluble bismuth salicylate in oil, from 1 to 2 grains per week. The incidence of pigmentary lesions of the oral cavity was approximately 80 per cent; edentulous mouths, 9 per cent. Severe cases showed pigmentation of the buccal mucosa. There were two cases of gangrenous stomatitis. Tartar accumulation was the important single factor in pigmentation. Chronic nephritis associated with faulty elimination was regarded as an important factor in gangrenous lesions of the mouth. Removal of tartar and improved oral hygiene hastens the elimination of pigment and tends to prevent further deposits.

T.

New Negative Mass for Making Accurate Plastic Reproductions (Paul Gross, Arch. Pathol., 16:869-872 [Dec.] 1933): The author describes the method of Poller as simple and easy to execute. Irregularities and undercutting in the surface contours do not hamper the worker. No preparation of the skin is required and it will not tear out hair. A face of a living person may be reproduced with the eyes open. The preparation is sterile and is applied at body temperature. It is satisfactory, therefore, for reproducing lesions, but it has been commercialized, the formulas kept secret and the materials made expensive. Gross presents a new negative mass, cheap and easily prepared and which gives satisfactory results. The negative mass consists of the following:

Material	Parts by Weight
Agar	100
Soft soap	100
Magnesium sulphate	40
Absorbent cellulose wadding	12
Water (this is variable; see text)	700-800

(The cellulose wadding from the so-called sanitary napkins or pads was used.)

The agar is heated in about 2,000 c.c. of water until it is completely dissolved. The cellulose wadding is macerated in hot water until the fibers have separated. It is then thoroughly stirred into the hot agar. The oil soap is next added, and when it is completely dissolved and incorporated into the agar mass, a concentrated solution of the magnesium sulphate is slowly poured into it. At the same time, the mass is vigorously stirred. This precipitates the insoluble magnesium soaps. The mass solidifies at about body temperature. The solid material is chopped fine or, preferably, ground in a food grinder. Since this mass contains from two and one-half to three times too much water, it is spread out

thinly on paper and allowed to dry at room temperature to a state in which the crumbs are distinctly moist but no water can be expressed. The material is then ready for use. Preparation of the mold or negative and of the positive or cast is given. The positive may be cast in plaster of paris, paraffin or resinous compounds. The method has the advantages enumerated above and the material may be used repeatedly.

T.

History Repeats in American Medical Education: Thirty years ago there were in the United States 160 medical schools with an enrolment of 26,147. Ten years later, as a result of the investigations of the Council on Medical Education and of the publicity afforded by the Carnegie Foundation for the Advancement of Teaching, the number of schools had been reduced to ninety-six and the enrolment to 14,891. Shortly after 1918, when the war ended, there was manifested a tendency to increase; in 1925 the number of students was 18,200. During the academic year just closed it was 22,888. We have returned nearly to the place where we were when the Council was created. True, the number of schools has not increased with the growing enrolments of recent years. Our 23,000 medical students today are distributed among fewer and better medical schools than were the students of a generation ago. But the factors that caused such deplorable conditions then are evidently again at work. These factors are the almost complete dependence on the income from tuition fees for the maintenance of the school and consequent failure to limit admissions to carefully selected and well qualified students. Unless this tendency is overcome there must result, inevitably, a lowering of the standards of medical education and practice. The tendency has been receiving the attention of the Council. Educators, state boards of examination, physicians and public authorities may well also give it their considération.—*J.A.M.A.*, 105:723 (Aug. 31) 1935.

Cleft Palate (W. E. M. Wardill, Lancet, 5834:1435 [June 22] 1935): A child with a cleft of the palate is hard to rear, as difficulties arise from the fact that sucking the breast or bottle is impossible if there is no adequate opponent for the tongue. Spoon or "fountain pen filler" feeding (or the use of some denture for the infant) can be successful only through much perseverance by mother or nurse. Operation to correct the cleft is advised before speech habits are formed. Pharyngoplasty, which aims at narrowing the nasopharynx and at producing a ridge on the posterior pharyngeal wall (in imitation of the ridge of Passavant, which normally arises in this location during speech) is advised. Against this ridge, the soft palate can make contact and close the nasopharynx. The operation is performed under endotracheal anesthesia. Repair of the palate is made at the same time. The various flaps and incisions recommended from the time of Langenbeck on are used to fit the particular case. After-treatment should not be elaborate. Feeding for ten days should consist only of sterile liquids.

M. K. Hine.

Postural Deformities and Bone Growth (A. B. Appleton, Lancet, 1:451 [March 3] 1934): This is the report of an experimental investigation of the effects of postural deformity on the bones and muscles in a series of healthy rabbits. The postural deformities were brought about by the application of splints or section of, or interference with, the nerve supply of some single muscle or group of muscles. These experiments have shown that changes in the form of healthy bones result from the adoption of unusual postures in growing animals, but no changes could be recognized in adult animals.—*Am. J. Dis. Child.*, 50:478 (Aug.) 1935.

Malignant Tumors of Mouth: Professor Lindemann, who is the director of the large West German clinic in Dusseldorf, where the treatment of diseases of the jaws is a specialty, has made a careful study of more than 200 cases of carcinoma and sarcoma. The results of a radical surgical treatment of these malignant tumors have improved greatly, chiefly owing to a better knowledge of the early symptoms and to

refinements in the surgical accomplishments as regards radical excisions of tumors, and because of the great advances in plastic surgery as applied to large defects of the face. The ability to avoid postoperative disturbances through the progress in local and regional anesthesia has been a great advantage. According to the experiences of Lindemann, an irradiation effects frequently a reduction in the size of such a tumor, so that a radical excision becomes possible. Another important question is as to whether an ulcerated tumor or a tumor that has led to regional metastases should be irradiated. Professor Schreus stated that the radiologic treatment will vary widely, depending on the site and the degree of extension to the deep-lying tissues, for which adequate methods have been worked out. In accordance with the special indications, the specialist will apply fractioned irradiation with short intervals, contact treatment with application of radium, radium needle treatment and irradiation by the Coutard method in the form of percutaneous therapy. Schreus has an increasing preference for radium treatment within the tumor, particularly in glandular metastases. In suitable cases the radial application of radium needles to the tumor is recommended. Some patients who were irradiated several years ago are still alive. If recurrences are to take place after unsuccessful irradiations, they usually appear promptly. From the experiences of Schreus, irradiation appears to be the preferred method in carcinoma of the upper jaw; also in lingual and in pharyngeal tumors.—*J.A.M.A.*, 105:732 (Aug. 31) 1935.

Foreign Literature

Effect of Vitamin D on Calcium Content of Dentine (E. Wilfred Fish, J. Physiol., 84:272 [June] 1935): An attempt was made to alter the calcium content of the dentin by feeding experimental animals large amounts of vitamin D and calcium over extended periods of time. Two teeth were extracted from each of five animals at the beginning of the experiment and the two symmetrically opposite teeth were removed at the end. A specimen of dentin was prepared from each tooth by removing the pulp, cementum and enamel and the odontogenetic zone. This block of dentin was then tested for the calcium content. The dogs were fed daily, in addition to the basal diet, 4 grains of calcium carbonate and 50,000 units of vitamin D. Checks were made from time to time on the calcium content of the blood. The results indicated that the blood calcium was almost doubled after the feeding time was completed. Roentgenograms revealed a marked increase in the opacity of the bones, but no apparent change in the opacity of the teeth. There was a small difference in the calcium content of the teeth extracted after the experiment was completed, but this fell well within the normal range of individual tooth variation.

M. W. McCrea.

Cancrum Oris in Ancient Rome (W. J. Rutherford, Brit. J. Dis. Child., 32:129, 1935): An unmistakable description of a fatal case of cancrum oris in a 6 year old girl, probably of a wealthy family, is noted. It was recorded by Martial, a Roman poet of the latter half of the first century A.D. The author feels that the poet's accuracy of description is reliable, although he would doubt any inferred details.

Hamilton Robinson.

Principles Concerned in Tooth Cavity Preparation (W. H. Gilmour, Proc. Royal Soc. Med., 28:1433, 1935): The author, after defining the terms to be used, gives a historical review of the literature on cavity preparation. He then describes by classes (Black's classification) the technic for preparing cavities for plastic and the non-plastic fillings. A brief note on the instruments used precedes the description. Separation is advised in the treatment of interproximal fillings. The author states that his technic is the same as that described by Kirk in his "Operative Dentistry," in 1912. Concluding the article is a description of the modifications necessary for the preparation of cavities for inlays.

G. Van Huysen.

Les Spasmes Faciaux d'Origine Dentaire (Bercher, Pomme and Duguet, Presse méd., 49:982 [June 19] 1935): Five cases in

which various types of facial paralysis and spasm were relieved by treatment of dental disorders are described. The various hypotheses for the mode of infection discussed include direct bacterial invasion of the motor nerves, indirect transmission and transmission through septicemia. The innervation of the facial muscles is discussed in some detail. Although the authors believe that the relationship between alveolar-dental disorders and facial paralysis and spasm is well established, they are unable to account definitely for the transmission of the infection.

HAMILTON ROBINSON.

Innervation of Tooth and Alveodental Ligament (B. V. D. Sprenkel, Rev. Odontol., 58:111 [Feb.] 1935): The author observes that pulpal nerve fibers form a subodontoblastic and supraodontoblastic plexus which, in turn, gives off amyelinated fibers that enter into the dental tubuli. In the ligament, the fibers terminate in three ways, on the collagen fibers, around the nuclei of the connective tissue cells and entering the dentin through the cementum meeting the pulpal terminals in the granular layer of Tomes and there again forming a plexus. Since the tooth contains such a nerve supply, the author risks the consideration that this wealth of nerves is a factor in function. He thinks of the tooth as an end organ for nervous reception adapted to the act of setting up reflexes regulatory to mastication. He does not give his technic for determining the distribution of the nerve termini and submits his deductions as of strong probability rather than asserted fact.

T.

Active Principle Contained in Dental Pulp (Pasquale Lippo, Stomatologia, 33: 613 [July] 1935): There exists in the dental pulp an active principle which is soluble in water and alcohol and unsoluble in ether and chloroform. This principle acts on the heart of frogs and toads, decreasing the number of heart beats, but increasing the amplitude of the pulsations. Such changes are also observed in coldblooded animals after treatment with atropine. In mammals which have undergone a previous vagotomy and atropine treatment, the blood pressure is lowered by peripheral vasodilatation. The author believes these results to be significant in the study of the biologic action of the pulp.

T.

Phosphatase in Normal Tooth, Variations in Certain Pathologic Forms (A. Provvisionato, 33:619 [July] 1935): The author reaches the following conclusions as a result of this study: 1. Phosphatase is present in the normal human tooth. 2. The amount diminishes with increasing age. 3. The amount varies in relation to processes of decalcification and to odontoblastic activity of the tooth. 4. In teeth affected with penetrating caries, the phosphatasic activity is notably increased. 5. In teeth with paradontosis, the quantity of the ferment is greatly increased.

T.

Rare Forms of Osteomyelitis (R. Meyer-Wildisen, Schweiz. med. Wchnschr., 65: 658 [July 20] 1935): Meyer-Wildisen points out that osteomyelitis usually attacks the lower extremity, chiefly the femur, and that it is generally caused by *Staphylococcus pyogenes-aureus.* This report shows that osteomyelitis may attack other bones and may be caused by other micro-organisms. He discusses three cases. In one patient, the second metatarsal was involved, in another the proximal phalanx of the middle finger, and in the third the femur. In the latter case it appears probable that typhoid was the cause of the osteomyelitis. The patient had typhoid twenty-one years before this attack of osteomyelitis. During the period of convalescence from typhoid she had had severe pains in the right thigh, and these pains had recurred from time to time. The present attack of osteomyelitis developed following overexertion. The pus of the osteomyelitic abscess was free from typhoid bacilli and also from other micro-organisms. The author says that the pus has been known to be sterile in other cases in which typhoid is the cause. He considers this case a relapsing osteomyelitis of typhoid origin. Traumatic origin was evident in the case in which the osteomyelitis was localized in the finger, but no such

cause could be detected in the case in which the metatarsal was involved. In this case further inquiry disclosed that several months before the onset of the suppuration in the foot the patient had had a varicella-like disorder. Since the vesicles of varicella are readily infected by the staphylococcus, it is assumed that the accidental infection of the impetiginous pustules was the cause of the osteomyelitis.—Abstr. *J.A.M.A.*, 105:839 (Sept. 7) 1935.

Influence of Anesthesia and of Operation on Leukocytes (H. Eufinger and W. Kiltz, Monatschr. f. Geburt. u. Gynäk., 99:279 [June] 1935): Eufinger and Kiltz found that ether inhalation anesthesia always produces a leukocytosis, which reaches its maximum from three to four hours after the anesthesia and completely disappears within twenty-four hours. If an aseptic operation is performed under ether anesthesia there likewise follows a leukocytosis, which reaches its maximum in from three to four hours and subsides after five days. Ether inhalation narcosis does not influence the adhesiveness of the leukocytes. The adhesiveness fails to change in spite of the leukocytosis. An operation is usually followed by a reduction in the adhesiveness, increasing and reaching its maximal value on the third or fourth day after the operation. This greater functional activity of the leukocytes is thus at its height at the time when the preceding leukocytosis has just subsided. Beginning with the fifth day the functional increase subsides again, and it reaches its initial value on the ninth or tenth day. The occurrence of the maximal adhesiveness of the leukocytes at a time when postoperative thromboses are most frequent indicates a causal connection between the two phenomena. The change in the adhesiveness seems to be of greater diagnostic significance than the number of leukocytes.—Abstr. *J.A.M.A.*, 105:472 (Aug. 10) 1935.

NEWS

IOWA

Life Members: Life Membership was voted twenty-nine Iowa dentists at the 1935 meeting in completion of twenty-five consecutive years as members of the Iowa State Dental Society.

Cash Essay Award for Senior Dental Class: In order to further stimulate the interest of the dental student in organized dentistry, the Iowa State Dental Society has set up an annual award of twenty-five dollars in cash for the best essay on organized dentistry by a member of the senior dental class of the University of Iowa. The essay is to cover the history and growth of dentistry and the responsibility of dental organizations for the continued progress of our profession.

MARYLAND

Appointments to State Board of Dental Examiners: Frank P. Haynes and A. P. Dixon have been appointed to membership on the Maryland State Board of Dental Examiners.

Heatwole Portrait Presented to School: A portrait of Timothy O. Heatwole, former dean of the Dental School of the University of Maryland and at present secretary of the Baltimore Schools of the University, was presented to the university in June by former students and friends and is now hanging in the office of the dean.

Semi-Annual State Meeting: The semi-annual meeting of the state association was held in Ocean City, September 9-10, the first day being devoted to papers and clinics, the second day to sports. F. Noel Smith, of Baltimore, is president and Maurice Brackett, of Denton, vice president. The Eastern Shore Society, of which O. W. Barton is president and G. H. Dana, vice president, was the host.

MASSACHUSETTS

Changes at Boston University: An-

nouncement has been made recently of the changes in the faculty of Boston University School of Medicine. In this list were included the names of Leroy M. S. Miner, who was promoted to the position of professor of stomatology, and Richard H. Norton, who was appointed assistant professor of stomatology.

MICHIGAN

Changes in Faculty of University of Michigan Dental School: With the resignation of Dr. Brown from the faculty, Paul Jeserick has been appointed to the chair of professor of operative dentistry and director of the clinic of the University of Michigan College of Dentistry. He also has been appointed chairman of the committee on graduate and postgraduate instruction. John Kemper is now professor of oral surgery and consultant dental surgeon of the university hospital. Philip Northrup and Louis Schultz are two new members of the faculty. Dr. Northrup will assist Dr. Kemper in the oral surgery department as assistant professor of oral surgery and assistant consultant dental surgeon to the university hospital. Dr. Schultz has been appointed to the operative dentistry department as an instructor.

NEW YORK

Regulations on Sale of Vitamin D Milk: In order that consumers may know what kind of vitamin D milk they are receiving, the department of health has recently issued regulations requiring complete information to be printed on the caps of bottles. This must include not only the method that has been used in fortifying the milk, but also the number of units of vitamin D per quart. The board has fixed the following minimum vitamin D content for the three kinds: if produced by feeding irradiated yeast to cows, 430 units per quart; if produced by direct irradiation with ultraviolet rays or carbon arc ray lamps, 135 units; if produced by the addition of concentrate, 400 units. The health department bulletin suggests that physicians give instructions as to which kind of vitamin D milk they wish their patients to receive.

WPA Assignment: Harold Jackson Davis, assistant director of local health administration of the state department of health, Albany, has been assigned as part-time consultant in medical care to the Works Progress Administration. Dr. Davis will pass on the professional aspects of all projects of the administration submitted from upstate New York which involve the employment of physicians, dentists, nurses and other health workers on a security wage. He will act also as liaison officer between the administration, the state and local departments of health and the state and local medical and other professional societies. He will serve also as technical adviser to the state compensation officer in regard to the professional aspects of the medical care and treatment provided to workers of the Works Progress Administration who are disabled in line of duty.

PENNSYLVANIA

Medical Seminars Deferred: The Philadelphia County Medical Society announces that the opening of its first medical seminar, on "Laboratory Methods and Clinical Application," has been postponed until November 29. This change has been made in view of the seminars on anesthesia that will be offered by the Philadelphia County Dental Society on six consecutive Fridays beginning October 18.

WASHINGTON

Postgraduate Course: At the invitation of the Seattle District Dental Society, Hermann Becks, professor of dental medicine at the University of California, and a member of the staff of the George Williams Hooper Foundation, gave a course on the "Fundamentals of Diagnosis in Dental Medicine" in Seattle, the week of September 9.

WYOMING

Dentist a Secretary of State: Nov. 6, 1934, Lester C. Hunt was elected secretary of state for a four year term. Dr. Hunt was graduated from St. Louis University in 1917. He was president of the Wyoming State Board of Dental Examiners in 1922-1926 and president of the

Wyoming State Dental Association, 1926-1927.

FOREIGN

Hunterian Professors Announced: At the quarterly meeting of the Council of the Royal College of Surgeons of England, the appointments of Hunterian professors for the ensuing year were announced. Among them is Arthur Bulleid, who is lecturing on dental sepsis as a factor in medical and surgical procedures.

Professorial Appointments: The number of full-time professorships in dental surgery in England is steadily if slowly increasing. G. L. Roberts, who was the tutor at the Birmingham Dental School, has recently been appointed to the Chair of Dental Surgery at Sheffield. H. R. B. Fenn, lecturer in dental prosthetics at Liverpool, has been appointed to the recently created chair of prosthetic dentistry in London University, tenable at Guy's Hospital Dental School. The latter is the first professorial appointment to a London school. Guy's, which was the first school to found a readership in operative dental surgery, has now followed this with the formation of a chair. Birmingham is now proposing to appoint a professor in dental surgery and thus the number of dental schools in England having full-time professors is steadily increasing.

Edward Mellanby Made Professor: Edward Mellanby, secretary of the Medical Research Council of England, has been appointed Fullerian professor of physiology at the Royal Institution.

GENERAL

Dental Practice Acts: Dentistry Not Divisible into Professional and Business Departments: The dental practice act of Wisconsin authorizes the state board of dental examiners on its own motion to make investigations and conduct hearings "in regard to the action of any licensed dentist and dental hygienist or any person who it has reason to believe is acting or has acted in such capacity within the state." Acting under this authority, the board served notices on Painless Parrmer, Inc., and A. J. Rust, a stockholder of that corporation, ordering them to appear before the board on a certain day "to give evidence." Rust and the corporation sought to restrain the board from holding the hearing, and from an adverse decision of the trial court they appealed to the Supreme Court of Wisconsin. The constitutionality of reasonable regulations over the dental profession has been upheld, said the court. The creation of the state board of dental examiners and the conferring on them of the power of investigation and of holding hearings in certain matters specified in the state are well within the constitutional requirements of an effective law. The legislature may enact legislation designed to accomplish the regulation of matters properly within the legislative field and may authorize an administrative commission, within valid limits, to provide rules and regulations for the administration and enforcement of the law within its expressed general purpose. This includes the right to conduct investigations and hold hearings pertinent to such purpose. The dental practice act in authorizing the board to hold hearings and to subpena witnesses violated no constitutional rights of the plaintiffs. The plaintiffs contended, however, that the board was without jurisdiction to hold the proposed hearing because neither of them was licensed to practice dentistry. The fact that the plaintiffs do not actually engage in the performance of dental operations is not controlling, said the court. The law contemplates regulation of the profession to such an extent as to protect the public not only against the unprofessional conduct of licensed dentists but also against other persons who, by management or some other intimate relation, are in charge of those who are practicing dentistry under a single management. The method of operating a dental corporation, the securing of patients desiring dental treatment by licensed dentists, is a proper subject of regulation under a system which recognizes the practice as a profession. The contract for the dental work is consummated between the plaintiffs and the patient, the

advertising by the corporation is also the act of the plaintiffs and in this manner they are holding themselves out as licensed dentists. In the case of *Painless Parker v. Board,* 216 California 285, 14 P. (2d) 67, the court, in answer to the contention that there is a distinction between the practice of dentistry and the purely business side of the practice, stated: "The law does not assume to divide the practice of dentistry into that kind of departments. Either one may extend into the domain of the other in respects that would make such a division impractical if not impossible. The subject is treated as a whole. If the contention of appellant be sound, then the proprietor of the business may be guilty of gross misconduct in its management and violate all standards which a licensed dentist would be required to respect and stand immune from any regulatory supervision whatsoever. His employe, the licensed dentist, would also be immune from discipline upon the ground that he was but a mere employe and was not responsible for his employer's misconduct, whether the employer be a corporation or a natural person. On grounds of public policy such a condition could not be countenanced. . . . No one would dispute the right of any person to own a dental office equipment. The question most appropriate here is whether the thing owned is used for a given purpose by a person lawfully entitled to so use it. Ownership is not the absolute test of the right of use." The notices that were sent to the plaintiffs, said the court, were lacking in fullness of detail and contained no careful statement of the charges, if any, which the board had under consideration. This fact, however, constitutes no warrant for the granting of injunctional relief. If and when the plaintiffs are accused of violating the provisions of the dental practice act, they will be afforded the opportunity of demanding a proper complaint in that proceeding. The Supreme Court therefore affirmed the order of the trial court, which, in effect, dismissed the action instituted by the plaintiffs.—*Rust v. State Board of Dental Examiners of Wisconsin (Wis.), 256 N. W. 919—J.A.M.A.,* 105:624 (Aug. 24) 1935.

Dental Practice Acts: Statutory Restrictions on Advertising Upheld; Regulatory Power of Board: The Modern System Dentists, Inc., the New System Dentists, Inc., and the Parks Painless Dentists, Inc., apparently engaged in the practice of dentistry in Wisconsin, sought to restrain the Wisconsin board of dental examiners from enforcing certain rules adopted by the board with reference to dental advertising. The trial court sustained a demurrer interposed by the board, and the plaintiffs appealed to the Supreme Court of Wisconsin. The dental practice act of Wisconsin provides that the term "unprofessional advertising," as used in the act, shall include: (1) advertisements containing untruthful, impossible, deceptive or misleading statements; (2) the advertising of professional superiority; (3) the advertising of fixed prices "when the nature of the service rendered and material furnished must be variable," and (4) advertising by means of large, display, glaring, illuminated or flickering light signs or sign which contains the representation of a tooth, bridge work or any portion of the human head. The act authorizes, furthermore, the board of dental examiners to adopt reasonable regulations pertaining to unprofessional advertising as defined in the act. The statutory restrictions on advertising were upheld, the court basing its holdings on the reasoning of the Supreme Court of Oregon in *Semler v. Oregon State Board of Dental Examiners,* 34 P. (2d) 311 (55 Sup. Ct. 570) abstracted in *The Journal,* June 1, page 2025, in which case the constitutionality of similar statutory provisions in the Oregon dental practice act was upheld. The Wisconsin act, said the Supreme Court of Wisconsin, does not deprive the plaintiffs of property without due process of law. If their practices are in the judgment of the legislature detrimental to the health, morals and welfare of the state, their activities may be restrained in the manner attempted by the dental practice act. The board, purportedly acting under

statutory authority, promulgated certain rules relative to advertising which the plaintiffs contended were invalid. The board declared that the following form of advertising tended to deceive or mislead the public, within the meaning of the act: (a) The advertising of particular services or appliances at a price "From $_____ Dollars up" or wording to that effect. . . . (d) Signs of dentists used in any other place except on the premises of the building in which the office is located. . . . Another rule promulgated by the board provided: Rule 5. It is the opinion of the Board that the nature of professional services rendered and materials required vary in each instant case and that the advertising of any fixed price for any particular operation or work is in violation of 152.06 (6) (c) which provides "Advertising definite, fixed prices when the nature of the professional services rendered and the materials required must be variable." The legislature, in the opinion of the court, having defined "unprofessional advertising," the power of the board was limited in that respect to a ruling as to what does and does not come within the statute and to amplifying and defining the terms used therein. The board ruling providing that advertising particular services or appliances at a price "From $_____Dollars up" tends to deceive or mislead the public was held to be clearly within the power of the board to adopt. On the other hand, the board had no authority to adopt the rule prohibiting the use of a sign in any place other than on the premises of the building in which the dentist's office is located, because, while the dental practice act restricts the contents of signs, it is silent concerning the place where the sign may properly be placed, whether on an office door, wall, billboard or in a newspaper. The validity of the rule providing that the nature of professional services is such that *all* dental services rendered and materials furnished are variable was upheld. This involved, in the opinion of the court, a matter of expert knowledge about which the members of the dental board were much better informed than any one outside the profession could possibly be. It may be argued, said the court, that from the language of the statute itself it follows as a necessary implication that there are some services and some materials which are not variable. That is a matter, however, on which the legislature had no more information than other laymen and they quite clearly left it to the board of dental examiners to determine that matter as a question of fact. Likewise, a rule relating to the size of advertisements and the maximum size of letters to be used thereon was upheld. Since some of the regulations adopted by the board were not authorized under the dental practice act, the Supreme Court held that the complaint stated a good cause of action and that the trial court erred in sustaining the demurrer interposed by the defendant board. The case was therefore remanded to the trial court with directions to overrule the demurrer.—*Modern System Dentists, Inc., et al. v. State Board of Dental Examiners of Wisconsin (Wis.), 256 N. W. 922.—J.A.M.A.*, 105:538 (Aug. 17) 1935.

Deaths

Marquis, Robert L., Berwyn, Ill.; University of Illinois College of Dentistry, 1906; died August 7; aged 61.

Mitchell, C. B., Bowling Green, Mo.; Washington University School of Dentistry, 1898; died August 12.

Nylund, Oscar C., Chicago, Ill.; Northwestern University Dental School, 1899; died September 1; aged 67.

MISCELLANY

BOOK REVIEWS

A Textbook of Surgery for Dental Students. By G. Percival Mills, M.B., B.S. (Lond.), F.R.C.S., Honorary Surgeon, General Hospital, Birmingham, Surgeon to the Royal Orthopaedic and Spinal Hospital, Birmingham, Orthopaedic Surgeon to the Children's Hospital, Birmingham, Consulting Surgeon, Victoria Hospital, Lichfield, Lecturer in Clinical Surgery, Birmingham University, and Humphrey Humphreys, O.B.E., M.C., T.D., K.H.P., M.B., Ch.B., M.D.S. (Birm.), L.D.S. (Eng.), Lecturer on Dental Anatomy, Birmingham University, Honorary Surgeon, Birmingham Dental Hospital. 342 pages; 63 illustrations. Price, $5.00. Fourth edition, published by Edward Arnold & Co., London, England.

The lapse of time since the publication of the third edition of this work in 1928 has given ample opportunity for a careful revision, and while much material has been added, the authors have shown commendable vision by eliminating a corresponding number of pages so that the book is no larger than the previous edition. Condensation should be the established order of the day in dental literature, for the reason that it is accumulating so rapidly that, without condensation, much of it would not be read. The part of the book of greatest interest and benefit to the student of dentistry begins at Chapter *X*, "Affections of the Face and Lips," page 197. From this time forward, the volume deals more intimately with those ailments that are likely to be encountered in dental practice, and it would seem that it might have been profitable for the authors to consider in greater detail the treatment of those affections arising from the teeth, and in which are involved those problems occurring in every-day dental experience. If one were to be critical, it might be said that the authors attempted to cover too much ground, though, on more mature reflection, it would be difficult to suggest what should be left out.

Proceedings of the Twelfth Annual Meeting of the American Association of Dental Schools; held at Chicago, Ill., March 18-20, 1935. Published by the Association. 275 pages.

Through the courtesy of G. D. Timmons, secretary-treasurer of the American Association of Dental Schools, this volume was submitted for review. It is filled with material of unusual interest to the dental educator, but owing to its specialized character does not demand a detailed review. To quote one observation from the address of the president, John T. O'Rourke: "There never was and never will be in dental education or practice, any effective substitute for services by highly qualified graduates, neither should there exist for long any system of protection for the poorly educated and unqualified. In the final analysis, the future of dental practice is as much in the hands of dental education as it is in the hands of government." The volume contains much of value on dental educational matters, and it should be carefully studied by dental teachers.

Index der deutschen zahnärztlichen Literatur und zahnärztliche Bibliographie. By Richard Hesse, Döbeln. Published by J. F. Lehmanns, Verlag, Paul-Heyse Strasse 20, Munich, Germany, 1930. Price, Geb. Mark 15,25 (approximately $4). 243 pages.

The Germans now have their index from 1846 to 1932 completed. This volume, for the year 1930, reflects the usual care and exactness for which German scientists are noted. The index is divided into sections, one of them giving the titles, names of the authors, medium of publication, reprinting, discussions, etc.; another, the list of

authors, and one, the leading terms (catch words), which enable one to find whatever he seeks in any particular branch of dentistry. The book is printed on good paper, enclosed in strong cardboard covers, with a cloth back. The growth of dental literature is apparent from these annual volumes. The 1905 yearbook listed 1,456 titles of articles, while the present (1930) volume contains 3,116 titles.

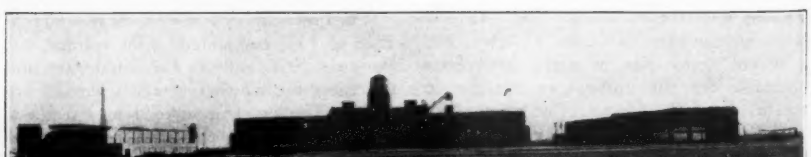
LOUIS OTTOFY.

CORRESPONDENCE

"SPHERICAL OCCLUSION"

To the Editor: Along with my criticism of Dr. Benson's article published in THE JOURNAL in March, printed in the August issue, page 1448, I sent two drawings which were not printed as part of my article. Consequently, every one who read my criticism undoubtedly thought that I was referring to Figure 1 and Figure 2 of Dr. Benson's article. But seeing the space allotted for such correspondence I realize how impracticable it would be to print figures and cuts. I shall therefore endeavor to picture them in words. Dr. Benson truthfully spoke of a spherical pyramid, the base points resting one on each condyle respectively and the other at the contact point of the lower incisors (or words of the same meaning). So let us consider one side of the spherical pyramid. The two lines descending from the apex are straight, but the line running from condyle to condyle is an arc of a circle the center of which is at the apex. Now designate the apex as O, the other points as A and as B. The line between A and B should be curved, not straight. Now take this drawing using the line OA as an axis and revolve it so that B describes a circle and you will see that the figure described will be a spherical sector. Dr. Benson took the intercondyle line as a straight line, thereby improperly describing a cone. When Dr. Benson uses cones and a cylinder, he sidetracks the spherical idea. I suggest to Dr. Benson that he read an editorial on dental prosthesis "Confusion Worse Confounded," published seven or eight years ago. I suggest the same for any other dentist who is interested in denture work. From the amount of reading I have been able to do, I have concluded that Dr. Monson's theory of spherical occlusion places the sphere upon the two condyles and the lower teeth; using, as one might say, a hollow sphere; whereas, the other theory builds a solid sphere, including the glenoid fossa and the upper teeth upon its spherical surface, and allowing the two condyles and the lower teeth to move upon this spherical surface. The two condyles are always in centric position with the center of the sphere, and the opening of the lower jaw does not change in any way this theory of spherical occlusion, but teeth may be articulated, curves of compensation being used to compensate for the cusp height and overbite. And in this theory, in the protrusive movement of the mandible, the incisal point follows the line of the great circle of the sphere, and the condyles follow lesser circles of the sphere. It is purely and simply a spherical theory, with no cones nor cylinders used.

JOHN LOUIS HELMER, D.D.S.,
4604 East Tenth Street,
Indianapolis, Ind.



New Orleans Airport.

ANNOUNCEMENTS*

CALENDAR OF MEETINGS

American Dental Association, New Orleans, La., November 4-8.

American Academy of Periodontology, New Orleans, October 31-November 2.

American Academy of Restorative Dentistry, New Orleans, November 2-3.

American Society of Oral Surgeons and Exodontists, New Orleans, November 1-2.

Arkansas City Dental Society, Arkansas City, Kan., October 13-15.

Association of American Women Dentists, New Orleans, November 4.

Chicago Dental Society Midwinter Clinic, February 17-20.

Greater New York December Meeting, New York City, December 2-6.

International Dental Congress, Vienna, August 2-9.

Midseason Clinic of the Connecticut State Dental Association, New Haven, November 14.

National Board of Dental Examiners, New Orleans, November 2-3.

Odontological Society of Western Pennsylvania, Pittsburgh, October 15-17.

Southern Society of Orthodontists, Chattanooga, Tenn., January 27-29.

Southwestern Society of Orthodontists, Houston, Texas, October 31-November 2.

Marquette University Dental Alumni Association, Milwaukee, Wis., November 20-23.

Montreal Dental Club Fall Clinic, October 17-19.

New England Dental Society, Boston, Mass., October 2-3.

American Dental Assistants Association, New Orleans, November 4-8.

American Dental Hygienists' Association, New Orleans, November 4-8.

Society for the Advancement of General Anesthesia in Dentistry, New York City, third Monday in February, April, October and December.

District of Columbia at George Washington University, Washington, D. C., second and fourth Tuesdays in each month from October to June, inclusive.

STATE SOCIETIES

October

Florida, at Tampa (3-5)

December

Ohio, at Columbus (2-4)

April

Connecticut, at Stamford (15-17)
Kansas, at Salina (27-29)
Massachusetts, at Boston (28-May 1)
Montana, at Butte (16-18)

May

Illinois, at Peoria (12-14)
Indiana, at Indianapolis (18-20)
New York, at New York City (12-15)
Tennessee, at Memphis (11-13)
West Virginia, at Fairmont (18-20)

STATE BOARDS OF DENTAL EXAMINERS

California, at San Francisco, December 9. Kenneth I. Nesbitt, 450 McAllister St., San Francisco, Secretary.

Connecticut, at Hartford, November 19-23. Almond J. Cutting, Southington, Recorder.

Colorado, June 23-27. David J. Tepley, 807 Republic Bldg., Denver, Secretary.

Indiana, at Indianapolis, November 18-21. J. M. Hale, Mt. Vernon, Secretary.

Iowa, at Iowa City, December 16-20. Hardy F. Pool, Mason City, Secretary.

New Jersey, December 2-7. John C. Forsyth, 140 W. State St., Trenton, Secretary.

Ohio, at Columbus, October 28. Morton H. Jones, 1553½ N. 4th St., Columbus, Secretary.

*Announcements must be received by the fifth day of the month in order to be published in the forthcoming issue of THE JOURNAL.

Texas, at Houston, December 9-13. R. T. Weber, 1014 Norwood Bldg., Austin, Secretary.

Wisconsin, at Milwaukee, December 9-13. S. F. Donovan, Tomah, Secretary.

THE CONNECTICUT DENTAL COMMISSION

The Connecticut Dental Commission will meet in Hartford, November 19-23, for the examination of applicants for license to practice dentistry and dental hygiene, and to transact any other business proper to come before it. Applications should be in the hands of the recorder at least ten days before the meeting. For application blanks and further information, apply to

ALMOND J. CUTTING, *Recorder,*
Southington.

IOWA STATE BOARD OF DENTAL EXAMINERS

The next examination of applicants to practice dentistry in Iowa will be held at the State University of Iowa, College of Dentistry, Iowa City, December 16-20. Applications properly executed, together with college diploma and fee of $25, must be filed with the State Department of Health, Des Moines, at least fifteen days prior to date of examination.

HARDY F. POOL, *Secretary,*
Mason City.

TEXAS STATE BOARD OF DENTAL EXAMINERS

The next examination of the Texas State Board of Dental Examiners will be held in Houston, December 9-13. There is no reciprocity. Applications must be filed at least ten days prior to the date of the examination. Address all communications for further particulars to

R. T. WEBER, *Secretary,*
1014 Norwood Bldg.,
Austin.

SOUTHERN SOCIETY OF ORTHODONTISTS
(Meeting Postponed)

The fourteenth annual meeting of the Southern Society of Orthodontists has been postponed and will be held at the Signal Mountain Hotel, Chattanooga, Tenn., January 27-29.

WILLIAM P. WOOD, JR., *Secretary,*
442 W. LaFayette St.,
Tampa, Fla.

NEW ENGLAND DENTAL SOCIETY

The annual meeting of the New England Dental Society will be held at the Forsyth Dental Infirmary, Boston, Mass., October 2-3.

BERNARD H. ALLEN, *Secretary,*
1169 Main St.,
East Hartford, Conn.

MARQUETTE UNIVERSITY DENTAL ALUMNI ASSOCIATION

The twenty-ninth annual meeting of the Marquette University Dental Alumni Association will be held at the university, Milwaukee, Wis., November 20-23.

E. R. GREENYA, *Secretary,*
830 E. Ogden Ave.,
Milwaukee, Wis.

F.D.I.

Congress Sections: The Congress will comprise fifteen sections. Three sections, each covering quite different fields, will meet at the same time in three different rooms. The working program of the Congress can thus be completed in five days. The morning will be devoted to reports and discussions, the relevant demonstrations being given in the afternoon. The sections of the Congress and the (provisional) division of time are as follows:

Monday: A.M.

1. Anatomy, physiology, histology, pathology, bacteriology and pharmacology.
2. Full denture prosthesis.
3. History of dentistry, documentation and professional press.

P.M. Demonstrations.

Tuesday: A.M.

4. Operative dentistry.
5. Crowns, fixed bridgework, ceramics.
6. Education.

P.M. Demonstrations.

Wednesday: A.M.

7. Anesthesia, narcosis, radiology.
8. Periodontal diseases.

9. Public dental services, social legislation.

P.M. Free. (Demonstrations of subjects 7-9 Friday p.m.)

Thursday: A.M.

10. Treatment of root-canals, focal infection.

11. Partial removable dentures.

12. Metallurgy.

P.M. Demonstrations.

Friday: A.M.

13. Oral surgery.

14. Orthodontics.

15. Physics, chemistry.

P.M. Demonstrations.

Saturday: F.D.I. closing sessions.

EXAMINATION FOR APPOINTMENT IN THE DENTAL CORPS OF THE NAVY

A competitive examination to select not more than forty for appointment in the Dental Corps of the Navy, when their services are required, will be held December 9 at the Naval Medical School, Washington, D. C., Naval Training Station, Great Lakes, Ill., and Naval Training Station, San Diego, Calif. A candidate for appointment in the Dental Corps must be a citizen of the United States, and must be between 21 and 32 years of age at the time of appointment, a graduate of a standard dental college, of good moral character and of unquestionable professional repute. Credentials relative to character, citizenship, date of birth and education must be submitted and approved before an applicant can be authorized to appear for examination. A circular which contains full information relative to the Dental Corps and describes the method of making application for appointment can be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

O. J. MINK, *Assistant to Bureau.*

Pontalba Buildings, New Orleans, sumptuous apartments built in 1849 for Baroness de Pontalba.

ADJACENT to New Orleans are the land of the Acadians, described in Longfellow's "Evangeline"; the Mississippi coast and the resorts of the Continent's edge; Grand Isle and its booming surf; the lovely Baratarian haunts of the Lafitte Pirates; the orange groves of Buras, America's oldest; the robust piney ozone of St. Tamany parish and the historic plains of Chalmette, where the Battle of New Orleans was fought in 1815.

Attend the ADA

An Intensive Postgraduate Course.

The 77th Annual Session

of the

American Dental Association

at

New Orleans, Louisiana

November 4-8, 1935

A course to familiarize the practicing dentist with the latest in research and the newest in practical developments.

CONVENTION

New Orleans Nov. 4-8. 1935

1835

RECENT BOOKS WORTH BORROWING* OR BUYING†

from the

LIBRARY BUREAU

of the

AMERICAN DENTAL ASSOCIATION

212 E. Superior St., Chicago, Ill.

Adams, C. W.	Your teeth and their care. St. Louis, Mosby, 1932. $1.25.
	Alfred David Lenz system of lost wax casting. New York, National Sculpture Soc., 1933. $2.00.
American Assn. Dental Schools	Course of study in dentistry. Chicago, American Assn. Dental Schools, 1935. $1.00 Paper, $1.50 Cloth.
American Pharmaceutical Assn.	Pharmaceutical recipe book. Baltimore, Md., American Pharmaceutical Assn., 1929. $5.00.
Anderson, G. M.	Orthodontic laboratory manual. St. Louis, Mosby, 1930. $2.00.
Anthony, L. P.	Dental terminology. Chicago, American Dental Assn., 1930. (Free.)
Appleton, J. L. T., Jr.	Bacterial infection with special reference to dental practice. Philadelphia, Lea & Febiger, 1933. $7.00.
Appleton, J. L. T., Jr., & Bryant, C. K.	Laboratory guide in bacteriology. Philadelphia, Lea & Febiger, 1928. $2.75.
Asgis, A. J.	Outline of dental socio-economics. New York, Allied Dental Council, 1934. $1.00.
Bartels, H. A.	Outline of bacteriology. New York, W. A. Broder, 1929. $2.00.
Bartlett, L. W., & Neel, Mildred B.	Compensations in the professions. New York, Association Press, 1933. $2.00.
Beck, Dorothy F.	Cost of equipping a dental office. Chicago, University of Chicago Press, 1932. $1.00.
Berger, Adolph	Principles and technique of oral surgery. Brooklyn, Dental Items of Interest Pub. Co., 1927. $7.00.
Berger, Adolph	Principles and technique of the removal of teeth. Brooklyn, Dental Items of Interest Pub. Co., 1929. $7.50.
Beust, T. B.	Dental histology and embryology. Philadelphia, Saunders, 1934. $3.00.
Blayney, J. R.	Dental pharmacology and therapeutics. St. Louis, Mosby, 1934. $4.50.
Blunt, Katherine, & Cowan, Ruth	Ultraviolet light and vitamin D in nutrition. Chicago, University of Chicago Press, 1930. $2.50.
Bödecker, C. F.	Elementary histology for dental hygienists. New York, W. A. Broder, 1929. $2.00.
Bogert, L. J.	Nutrition and physical fitness. Philadelphia, Saunders, 1935. $3.00.
Bosworth, H. J.	Dental economics. Chicago, Bosworth Economic Institute, 1932. $3.00.
Bowler, Inez	Elementary manual of dental library practice. Ann Arbor, Univ. of Michigan Press, 1932. $1.50.
Box, H. K.	Necrotic gingivitis. Toronto, University of Toronto Press, 1930. $1.25.

*Books may be *borrowed* by members of the Association for a period of one week after date of receipt; and if not reserved for some one else, the period will be extended on request. A deposit of $2.00 for each volume to be sent at one time should accompany all requests for books. This will be refunded on return of books.

†If you wish to *purchase* books, indicate plainly which books you desire and enclose check with order.

Box, H. K.	Treatment of the periodontal pocket. Toronto, University of Toronto Press, 1928. $1.25.
Bregstein, S. J.	Business conduct of an ethical practice. Brooklyn, Dental Items of Interest Pub. Co., 1932. $4.00.
Broderick, F. W.	Dental medicine. St. Louis, Mosby, 1928. $6.00.
Broderick, R. A.	Dental bacteriology. Outlines of dental science. Vol. 2. Edinburgh, Livingstone, 1926. $2.50.
Brothers, E. D.	Dental jurisprudence. St. Louis, Mosby, 1928. $2.25.
Brown, A. J.	Dental metallurgy. Outlines of dental science. Vol. 11. New York, Wood, 1928. $2.50.
Brown, W. L.	Endocrines in general medicine. St. Louis, Mosby, 1927. $3.00.
Buckley, J. P.	Modern dental materia medica, pharmacology and therapeutics. Philadelphia, Blakiston, 1926. $6.00.
Bulleid, Arthur	Textbook of bacteriology for dental students. St. Louis, Mosby, 1927. $4.50.
Bunce, E. W.	Bunce-Kanouse full denture technic. Chicago, Coe Laboratories, Inc., 1929. $1.25.
Bunting, R. W.	A textbook of oral pathology for students and practitioners of dentistry. Philadelphia, Lea & Febiger, 1929. $7.00.
Burchard, H. H., & Inglis, O. E.	Textbook of dental pathology and therapeutics for students and practitioners. Philadelphia, Lea & Febiger, 1926. $7.50.
Burkhart, H. J.	Care of the mouth and teeth. (National Health Series.) New York, Funk & Wagnalls, 1928. $0.30.
Buxton, J. L. D.	Dental pathology. Outlines of dental science. Vol. 7. New York, Wood, 1927. $2.50.
Buxton, J. L. D.	Dental surgery. Outlines of dental science. Vol. 8. New York, Wood, 1927. $2.50.
Cahn, L. R.	Basic principles of general and oral pathology. Brooklyn, N. Y., Dental Items of Interest Pub. Co., 1929. $4.50.
Campbell, Menzies	Those teeth of yours. London, Heinemann, 1931. $1.50.
Casto, T. D.	Questions and answers on pedodontology, with glossary. Philadelphia, Author, 1932. $2.50.
Cattell, Psyche	Dentition as a measure of maturity. Cambridge, Harvard University Press, 1928. $1.00.
Childs, Leslie	Law for the dentist. Philadelphia, S. S. White, 1934. (Subscription premium)
Churchill, H. R.	Human odontography and histology. Philadelphia, Lea & Febiger, 1932. $4.50.
Clark, C. A.	Dental radiography. Outlines of dental science. Vol. 5. New York, Wood, 1926. $2.50.
Cogswell, W. W.	Dental oral surgery. Pittsburgh, Penna., Dental Digest, Inc., 1932. $10.00.
Colyer, J. F., & Sprawson, Evelyn	Dental surgery and pathology. New York, Longmans, 1931. $12.50.
Colyer, Stanley	Chronic infection of the jaws: a short radiological and clinical study. New York, Macmillan, 1926. $3.50.
Committee on Costs of Medical Care	Medical care for the American people. Chicago, Univ. of Chicago Press, 1932. $1.50.
Council on Dental Therapeutics, American Dental Assn.	Accepted dental remedies. Chicago, American Dental Assn., 1935. $1.00.
Dall, William	Ground porcelain inlays. London, Henry Kimpton, 1933. $5.25.
Daukes, S. H.	Medical museum: Modern developments, organization and technical methods based on a new system of visual teaching. London, Wellcome Foundation, Ltd., n.d. (No purchase orders accepted.)
Davis, Adelle	Optimum health. Los Angeles, California Graphic Press, 1935. $2.50.

Davis, M. M.	Paying your sickness bills. Chicago, University of Chicago Press, 1931. $2.50.
Dental Board of the United Kingdom	Four lectures on "general anaesthesia." London, Dental Board of the United Kingdom, 1926. $2.00.
Dental Board of the United Kingdom	Three lectures on "dental alloys." Delivered under the auspices of the Dental Board of the United Kingdom. London, Dental Board of the United Kingdom, 1927. $2.00.
Diamond, M.	Dental anatomy. A graphic presentation of tooth forms with an original technique for their reproduction. New York, Macmillan, 1929. $3.50.
Dorrance, G. M.	Operative story of cleft palate. Philadelphia, Saunders, 1933. $6.50.
Doxtater, L. W.	Procedures in modern crown and bridge-work. Brooklyn, N. Y., Dental Items of Interest Pub. Co., 1931. $8.00.
Endleman, Julio	Special dental pathology; a treatise for students and practitioners. St. Louis, Mosby, 1927. $7.00.
Ennis, L. M.	Dental roentgenology. Philadelphia, Lea & Febiger, 1931. $6.50.
Farkasch, O.	Dilemmas of dentistry. New York, Dodd Bros., 1931. $3.50.
Federspiel, M. N.	Harelip and cleft palate. St. Louis, Mosby, 1927. $5.00.
Felcher, F. R.	Art of porcelain in dentistry. St. Louis, Mosby, 1932. $9.00.
Feldman, M. H.	Manual of exodontia. Philadelphia, Lea & Febiger, 1930. $3.50.
Ferguson, H. W.	Child's book of the teeth. Yonkers-on-Hudson, World Book Co., 1932. $0.68.
Fine, Samuel	Principles and practice of dental assistant. Worcester, Mass., Hamilton Pub. Co., 1931. $2.50.
Fischer, Guido	Local anesthesia in dentistry. Philadelphia, Lea & Febiger, 1933. $4.00.
Fish, E. W.	Experimental investigation of enamel, dentine and the dental pulp. London, John Bale, Sons & Danielsson, Ltd., 1933.
Fish, E. W.	Principles of full denture prosthesis. London, John Bale, 1933. $4.00.
Fones, A. C.	Mouth hygiene; a textbook for dental hygienists. Philadelphia, Lea & Febiger, 1934. $5.00.
Fones, A. C.	Preventive dentistry. Philadelphia, Lea & Febiger, 1925. $2.75.
Foote, J. S.	Bone as a measure of development: When and how we acquired our teeth. Chicago, American Dental Association, 1928. $4.00.
Frahm, F. W.	Principles and technics of full denture construction. Brooklyn, Dental Items of Interest, 1934. $7.00.
Franzen, Raymond	Public health aspects of dental decay in children. New York, American Child Health Assn., 1930. $1.25.
Gies, W. J.	Dental education in the United States and Canada. New York, Carnegie Foundation, 1926. (Free.)
Gillett, H. W., & Irving, A. J.	Gold inlays by the indirect system. Brooklyn, Dental Items of Interest, 1932. $8.00.
Goepp, R. M.	Dental state board questions and answers. Philadelphia, Saunders, 1928. $4.50.
Goslee, H. J.	Principles and practice of crown and bridge-work. Brooklyn, Dental Items of Interest Pub. Co., 1926. $7.50.
Gottlieb, B., & Orban, B.	Die veränderungen der gewebe bei übermässiger beanspruchung der zähne. Leipzig, Georg Thieme, 1931. Unbound, $6.50. Bound, $7.00.
Graves, Lulu G.	Foods in health and disease. New York, Macmillan, 1932. $3.50.
Greenfield, A. L.	Interpretation of dental radiograms. Rochester, N. Y., Ritter Dental Mfg. Co., 1926. $2.50.
Gregory, W. K.	Our face from fish to man. New York, Putnam, 1929. $4.50.
Gwathmey, J. T.	Textbook of anesthesia. New York, Macmillan, 1929. $7.50.
Gwinn, C. D.	Textbook of exodontia. Philadelphia, Lea & Febiger, 1927. $2.75.
Gysi, Alfred	Special teeth for cross-bite cases. New York, Dentists' Supply Co., 1928. (Pamphlet.) (No purchase orders accepted.)

Hackh, I. W. D.	Chemical reactions and their equations. Philadelphia, Blakiston, 1928. $2.00.
Haden, R. L.	Dental infection and systemic disease. Philadelphia, Lea & Febiger, 1928. $2.50.
Hall, E. M.	Pulpless tooth problems. Detroit, Mich., Detroit Dental Manufacturing Co., 1930.
Hanau, R. I.	Dental engineering. Buffalo, N. Y., Author, 1926. (No purchase orders accepted.)
Hanau, R. I.	Hanau intraoral method vs. Gysi extraoral method. Buffalo, N. Y., Author, 1927. (No purchase orders accepted.)
Hanke, M. T.	Diet and dental health. Chicago, Univ. of Chicago Press, 1933. $4.00.
Harder, O. E.	Modern dental metallography. Minneapolis, Minn., Burgess-Roseberry Co., 1930. $3.75.
Harrow, Benjamin, & Sherwin, C. P.	Textbook of biochemistry. Philadelphia, Saunders, 1935. $6.00.
Hartman, L. L.	Teeth and the mouth. New York, Appleton, 1927. $1.50.
Head, Joseph	Everyday mouth hygiene. Philadelphia, Saunders, 1925. $1.00.
Hedstrom, Gustav	Gangrene of dental pulp and its treatment. Stockholm, Sweden, Isaac Marcus, 1927. (No purchase orders accepted.)
Headridge, Davis, & Gibson, S. K.	Dental anatomy, human and comparative. Outlines of dental science. Vol. 6. New York, Wood, 1928. $2.50.
Herbst, Emil, & Apffelsteadt, Max	Atlas and grundriss der missbildungen der kiefer and zähne. München, J. F. Lehmanns, 1928. (No purchase orders accepted.)
Hertzler, E.	Technic of local anesthesia. St. Louis, Mosby, 1925. $5.50.
Hess, Walter, & Zurcher, Ernst	Anatomy of the root-canals of the teeth. New York, Wood, 1925. $5.50.
Hewer, C. L.	Recent advances in anaesthesia and analgesia. Philadelphia, Blakiston, 1932. $3.50.
Hildebrand, G. Y.	Studies in masticatory movements of human lower jaw. Berlin, Gruyter, 1931. (No purchase orders accepted.)
Hodgen, J. D.	Practical dental metallurgy. St. Louis, Mosby, 1932. $3.75.
Hogeboom, F. E.	Practical pedodontia or juvenile operative dentistry and public health dentistry. St. Louis, Mosby, 1933. $6.50.
Hoke, C. M.	Testing precious metals: gold, silver, palladium, platinum; identifying, buying, selling. New York, Jewelers Technical Advice Co., 1935. $1.00.
Holliday, Houghton	Dental radiology handbook. New York, Macmillan, 1935. $2.00.
Hyatt, T. P.	Hygiene of mouth and teeth. Brooklyn, N. Y., Brooklyn Dental Pub. Co., 1929. $1.00.
Hyatt, T. P.	Prophylactic odontotomy: A practical and simple procedure for the prevention of caries in pit and fissure cavities. New York, Macmillan, 1933. $1.50.
Ivy, R. H., & Curtis, Lawrence	Fractures of the jaws. Philadelphia, Lea & Febiger, 1931. $4.50.
Jamieson, J. D. H.	Operative dentistry. Outlines of dental science. Vol. 9. New York, Wood, 1927. $2.50.
Jerman, E. C.	Modern x-ray technic. St. Paul, Bruce Pub. Co., 1928. $5.50.
Jordan, E. O.	Textbook of general bacteriology. Philadelphia, Saunders, 1935. $6.00.
Jordan, M. Evangeline	Operative dentistry for children. Brooklyn, Dental Items of Interest Pub. Co., 1927. $5.00.
Kanner, Leo	Folklore of the teeth. New York, Macmillan, 1928. $4.00.
Kells, C. E.	Dentists' own book, including a complete bookkeeping and recording system. St. Louis, Mosby, 1925. $7.50.
Kells, C. E.	Three score years and nine. New Orleans, The Author, 1926. $8.00.
Kennedy, Edward	Partial denture construction. Brooklyn, N. Y., Dental Items of Interest Pub. Co., 1928. $7.50.

Kent, E. N.	Business side of dentistry. St. Louis, Mosby, 1929. $5.00.
Knapp, K. W.	Manual of fixed bridgework. New York, New York Univ. Press, 1935. $3.00.
Korkhaus, Gustav	Moderne orthodontische therapie. Berlin, Meusser, 1932.
Kronfeld, Rudolf	Histopathology of the teeth and their surrounding structures. Philadelphia, Lea & Febiger, 1933. $7.00.
Kuttler, Yury	Mis investigaciones sobre la denticion en 15,240 ninos y 782 adultos habiendo hecho 28,557 examenes. Mexico, D. F., Facultad Odontologica de la Universidad Nacional Autonoma de Mexico, 1933.
Lee, R. I., & Jones, L. W.	Fundamentals of good medical care. Chicago, Univ. Chicago Press, 1933. $2.50.
LeGro, A. L.	Ceramics in dentistry. Brooklyn, N. Y., Dental Items of Interest Pub. Co., 1926. $7.50.
Leriche, R., & Policard, A.	Normal and pathological physiology of bone. St. Louis, Mosby, 1928. $5.00.
Leuck, Miriam S.	Study of dental clinics in the United States: 1930. Chicago, University of Chicago Press, 1932. $1.00.
Leuck, Miriam S.	Further study of dental clinics in the United States. Chicago, University of Chicago Press, 1932. $1.50.
Leven, Maurice, & Beck, Dorothy F.	Practice of dentistry and incomes of dentists in twenty states: 1929. Chicago, University of Chicago Press, 1932. $2.00.
Lindsay, Lilian	Short history of dentistry. London, John Bale, 1933. $1.50.
Livingston, Alexander	Dental histology. Outlines of dental science. Vol. 10. New York, Wood, 1928. $2.50.
Lloyd-Williams, E.	Dental mechanics: a manual for students and junior practitioners. London, Bale, 1931. $2.00.
Logan, J. D.	Dental prosthetics. Outline of dental science. Vol. 4. Edinburgh, Livingstone, 1926. $2.50.
Lucas, H. A.	Medicine for dental students. Baltimore, William Wood & Co., 1933. $2.75.
MacNevin, M. G., & Vaughan, H. S.	Mouth infections and their relation to systemic diseases. New York, Joseph Purcell Memorial, 1933. $4.00.
Macphie, G. G.	Studies in aetiology of dental caries. London, John Bale, 1935. $2.50.
Maliniak, J. W.	Sculpture in the living: rebuilding face and form by plastic surgery. New York, Lancet Press, 1934. $3.00.
Margolis, H. M.	Conquering arthritis. New York, Macmillan, 1932. $2.00.
Marriott, W. M.	Infant nutrition: a textbook of infant feeding for students and practitioners of medicine. St. Louis, Mosby, 1930. $5.50.
Marsden, P. H.	Dental material medica. Outlines of dental science. Vol. 3. Edinburgh, Livingstone, 1926. $2.50.
Marshall, J. A.	Diseases of the teeth; their diagnosis and treatment. Philadelphia, Lea & Febiger, 1926. $4.50.
Maximow, A. A., & Bloom, Wm.	Textbook of histology. Philadelphia, Saunders, 1934. $7.00.
McBride, W. C.	Juvenile dentistry. Philadelphia, Lea & Febiger, 1932. $2.75.
McCaw, Emma J.	Dental assistant. St. Louis, Mosby, 1926. $1.50.
McCollum, E. V., & Becker, Ernestine	Food, nutrition and health. Baltimore, Authors, 1933. $1.50.
McCollum, E. V., & Simmonds, Nina	Newer knowledge of nutrition. New York, Macmillan, 1929. $4.00
McCoy, J. D.	Applied orthodontics. Philadelphia, Lea & Febiger, 1935. $4.50.
McGehee, W. H. O.	Textbook of operative dentistry. Philadelphia, Blakiston, 1930. $10.
Mead, S. V.	Anesthesia in dental surgery. St. Louis, Mosby, 1935. $6.50.
Mead, S. V.	Diseases of the mouth. St. Louis, Mosby, 1932. $10.00.
Mead, S. V.	Oral surgery. St. Louis, Mosby, 1933. $12.50.
Mellanby, May	Diet and the teeth: an experimental study. Part I. Dental structure in dogs. London, His Majesty's Stationery Office, 1929. $7.00.

Mellanby, May	Diet and the teeth: an experimental study. Part II. A. Diet and dental disease. B. Diet and dental structure in mammals other than the dog. London, His Majesty's Stationery Office, 1930. $1.00.
Merritt, A. H.	Periodontal diseases: diagnosis and treatment. New York, Macmillan, 1930. $4.00.
Mills, C. P., & Humphreys, Humphrey	Text-book of surgery for dental students. London, Arnold, 1935. $5.00.
Moorehead, F. B., & Dewey, Kaethe W.	Pathology of the mouth. Philadelphia, Saunders, 1925. $7.00.
Neil, Ewell	Full denture practice. Nashville, Tenn., Marshall and Bruce Co., 1932. $3.50.
Nevin, Mendell, & Puterbaugh, P. G.	Conduction, infiltration and general anesthesia in dentistry. Brooklyn, Dental Items of Interest Pub. Co., 1927. $6.00.
Nichols, I. G.	Prosthetic dentistry: an encyclopedia of full and partial denture prosthesis. St. Louis, Mosby, 1930. $12.50.
Ochsner, E. H.	Social insurance and economic security. Boston, Bruce Humphries, 1934. $2.50.
Okumura, Tsurukichi	Present status of dentistry in Japan. Tokyo, Japan, Japan Dental Assn., 1931. (Pamphlet.) (No purchase orders accepted.)
Orban, Balint	Dental histology and embryology. Philadelphia, Blakiston, 1929. $5.00.
Osgood, H. A.	Teeth and jaws roentgenologically considered. Annals of roentgenology, volume 5. New York, Hoeber, 1929. $10.00.
Ottolengui, Rodrigues	Table talks on dentistry. Brooklyn, Dental Items of Interest Pub. Co., 1928. $7.00.
Palmer, Bissell	Paying through the teeth. New York, Vanguard Press, 1935. $2.00.
Palmer, G. T., Derryberry, Mahew & Van Ingen, Philip	Health protection for preschool child: national survey of use of preventive medical and dental service for children under six. New York, Century, 1931. $2.50.
Perry, Maude A.	Dietetics and nutrition. St. Louis, Mosby, 1930. $2.50.
Phelps, Edith M.	Socialization of medicine. New York, Wilson, 1930. $0.90.
Pollia, J. A.	Fundamental principles of alveolo-dental radiology. Brooklyn, Dental Items of Interest Pub. Co., 1930. $8.00.
Posner, J. J.	Minor oral surgery simplified. Philadelphia, Patterson & White, 1928. $2.00.
Prinz, Herman	Dental formulary. Philadelphia, Lea & Febiger, 1930. $3.50.
Prinz, Herman	Dental materia medica and therapeutics. St. Louis, Mosby, 1926. $7.50.
Prinz, Herman, & Greenbaum, S. S.	Diseases of the mouth and their treatment. Philadelphia, Lea & Febiger, 1935. $9.00.
Prinz, Herman	Diseases of soft structures of teeth. Philadelphia, Lea & Febiger, 1928. $6.50.
Prothero, J. H.	Prosthetic dentistry. Chicago, Medico-Dental Pub. Co., 1928. $10.00.
Pusey, W. A.	Doctor of the 1870's and 1880's. Baltimore, C. C. Thomas, 1932. $3.00.
Quigley, D. T.	Notes on vitamins and diets. Chicago, Consolidated Book Publishers, Inc., 1933. $1.00.
Raper, H. R.	Clinical preventive dentistry. Rochester, N. Y., Ritter Dental Mfg. Co., 1926. $3.50.
Rapp, F. W.	Elements of anatomical articulation or the mathematics of dental prosthetics. London, Bale, 1930. $2.00.
Ray, K. W.	Metallurgy for dental students. Philadelphia, Blakiston, 1931. $3.00.
Report of Committee on Growth and Development	Growth and development of the child. Part III. Nutrition. (A publication of White House Conference on Child Health and Protection.) New York, Century, 1932. $4.00.
Report of Committee on Public Health Organization	Public health organization. (A publication of White House Conference on Child Health and Protection.) New York, Century, 1932. $3.00.

Reports of Subcommittees on Nutrition and Health Centers	Nutrition service in the field. Child health centers: a survey. (A publication of White House Conference on Child Health and Protection.) New York Century, 1932. $2.00.
Roberts, Lydia J.	Nutrition work with children. Chicago, University of Chicago Press, 1927. $3.50.
Rose, Mary S.	Foundations of nutrition. New York, Macmillan, 1927. $2.75.
Rubinow, I. M.	Quest for security. New York, Holt, 1934. $3.50.
Rukeyser, M. S.	Doctor and his investments. Philadelphia, Blakiston, 1931. $2.50.
Sampson, Edward	Common sense dentistry. London, Cottrell & Co., 1935. $2.25.
Schroff, Joseph	Fundamentals of pathology. New York, W. A. Broder, 1929. $2.50.
Schutzman, A. M.	Irregular teeth: causes, effects. Baton Rouge, La., Franklin Press, 1934. $2.00.
Scruggs, A. M.	Glory of earth. (A book of poems by a dentist.) Oglethorpe Univ., Press, 1933. $2.00.
Sears, V. H.	Full denture procedure. New York, Macmillan, 1929. $2.00.
Seldin, H. M.	Practical anesthesia for dental and oral surgery. Philadelphia, Lea & Febiger, 1934. $7.00.
Shaw, D. M.	Dental prosthetic mechanics. London, Arnold, 1927. $7.50.
Sherman, H. C.	Food and health. New York, Macmillan, 1934. $2.50.
Sherman, H. C.	Vitamins. New York, Chemical Catalogue Co., Inc., 1931. $6.00.
Sicher, Harry, & Tandler, Julius	Anatomie für Zahnärzte. Vienna, Julius Springer, 1928. (No purchase orders accepted.)
Silverman, S. L.	Principles and practice of oral surgery. Philadelphia, Blakiston, 1926. $6.00.
Simon, P. W.	Fundamental principles of systematic diagnosis of dental anomalies. Boston, Stratford, 1926. $5.00.
Simon, W., & Base, Daniel	Manual of chemistry. Philadelphia, Lea & Febiger, 1927. $5.00.
Simons, A. M., & Sinai, Nathan	Way of health insurance. Chicago, University of Chicago Press, 1932. $2.00.
Simpson, C. O.	Advanced radiodontic interpretation. St. Louis, University Press, 1931. $25.00. (Because of the unusual price and its lack of durability a rental fee of $1.00 will be charged for this book for each two weeks it is in circulation.)
Simpson, C. O.	Technic of oral radiography. St. Louis, Mosby, 1928. $5.00.
Simpson, C. O.	Toothsome topics. St. Louis, University Press, 1931. $2.50.
Skinner, E. W.	Dental materials and technology. Cleveland, Ohio, Author, 1933.
Smith, D. T.	Oral spirochetes and related organisms in fusospirochetal disease. Baltimore, Williams & Wilkins, 1932. $4.50.
Smith, G. F. R.	Dental anaesthesia. Outlines of dental science. Vol. 1. Edinburgh, Livingstone, 1926. $2.50.
Smyth, Corisande, & Young, Matthew	Facial growth in children. London, His Majesty's Stationery Office, 1932. $0.75.
Sorrin, Sidney, & Miller, S. C.	Practice of periodontia. New York, Macmillan, 1928. $3.50.
Southwell, Charles	Your dentist: that which you have a right to expect of him, etc. Milwaukee, Wis., Gilbert Lee Company, 1934. $1.30.
Steadman, F. St. J.	Pyorrhea alveolaris. St. Louis, Mosby, 1927. $9.25.
Stibbe, E. P.	Anatomy for dental students. Baltimore, Wood, 1934. $6.00.
Stieglitz, Julius	Chemistry in medicine. New York, Chemical Foundation, 1928. $2.00.
Stillman, P. R., & McCall, J. O.	Textbook of clinical periodontia. New York, Macmillan, 1927. $4.50.
Stillson, W. C.	Dental anatomy: classroom and laboratory quiz compend with supplementary notes. Philadelphia, Saunders, 1929. $2.25.
Stoloff, C. I.	Your teeth. New York, Dutton, 1929. $2.50.
Strang, R. H. W.	Textbook of orthodontia. Philadelphia, Lea & Febiger, 1933. $10.00.
Sure, Barnett	Vitamins in health and disease. Baltimore, Williams & Wilkins Co., 1933. $2.00.

Suter, A. B. W. — Dentistry—a profession and a business. Rochester, N. Y., Ritter Dental Mfg. Co., 1930. $7.50.

Swartz, J. H., & Reilly, Margaret — Diagnosis and treatment of skin diseases. New York, Macmillan, 1935. $3.50.

Swenson, M. G. — Outline of full denture prosthesis. New York, New York Univ. Book Store, 1932.

Tanguy, T. V. — Science and practice of actinotherapy. St. Louis, 1928. $3.00.

Thoma, K. H. — Clinical pathology of the jaws. Springfield, Ill., C. C. Thomas, 1934. $9.00.

Toverud, K. U., & Toverud, Gottorm — Studies on the mineral metabolism during pregnancy and lactation and its bearing on the disposition to rickets and dental caries. Uppsala, Almqvist & Wiksells Boktryckeri-A-B, 1931. (Pamphlet.) (No purchase orders accepted.)

Turner, C. R., & Anthony, L. P. — American textbook of prosthetic dentistry. Philadelphia, Lea & Febiger, 1932. $10.00.

Tyree, C. — Dental health in the prevention of disease. London, Kentucky, Author, 1927. $2.75.

Ullmann, E. V. — Diet in sinus infections and colds. New York, Macmillan, 1933. $2.00.

Urling, L. H. — Your teeth; their care and preservation. Philadelphia, Dorrance, 1932. $1.50.

Vines, H. W. C., & Lynch, K. M. — Green's manual of pathology. Baltimore, Wood, 1934. $6.50.

Wallace, J. S. — Physiology of oral hygiene and recent research. London, Bailliere, Tindall & Cox, 1929. $4.00.

Wallace, J. S. — Teeth and health. London, Faber & Gwyer, 1926. $1.40.

Wallace, J. S. — Variations in the form of the jaws, with special reference to their etiology and their relation to the occlusion of the dental arches. New York, Wood, 1926. $6.00.

Ward, M. L. — American textbook of operative dentistry. Philadelphia, Lea & Febiger, 1926. $10.00.

Webster, A. E. — Manual for dental assistants. Philadelphia, Lea & Febiger, 1932. $3.50.

Weinberger, B. W. — Orthodontics: an historical review of its origin and evolution. 2 vols. St. Louis, Mosby, 1926. $10.00.

Wilensky, A. O. — Osteomyelitis, its pathogenesis, symptomatology and treatment. New York, Macmillan, 1934. $9.00.

William, Maurice — Sun Yat-Sen versus communism. New evidence establishing China's right to the support of democratic nations. Baltimore, Williams & Wilkins, 1932. $5.00.

Williams, Pierce, & Chamberlain, Isabel — Purchase of medical care through fixed periodic payment. New York, National Bureau Economic Research, 1932. $3.00.

Winter, G. B. — Principles of exodontia, as applied to the impacted mandibular third molar. St. Louis, American Medical Book Co., 1926. $15.00.

Winter, Leo — Textbook of exodontia. St. Louis, Mosby, 1931. $10.00.

Wolfenden, H. H. — Real meaning of social insurance. Toronto, Canada, Macmillan, 1932. $2.00.

Woodbury, C. E. — Making and filling of cavities in the proximal surface of the front teeth with gold foil. Omaha, Neb., Author, 1929. $5.00.

Woodhouse, C. G., & Schiffman, Ruth Y. — Dentistry: its professional opportunities. Greensboro, N. C., Woman's College of Univ. of North Carolina, 1934. $1.00.

Zemsky, J. L. — Oral diseases: practical treatise offering diagnostic and therapeutic aid to the practitioner of medicine and dentistry. Brooklyn, N. Y., Physicians and Surgeons Book Co., 1930. $8.00.

Zemsky, J. L. — Outline of oral surgery. Brooklyn, N. Y., Physicians and Surgeons Book Co., 1930. $4.50.

Zoethout, W. D. — Textbook of physiology. St. Louis, Mosby, 1928. $4.50.

OFFICERS AND TRUSTEES OF THE AMERICAN DENTAL ASSOCIATION
1934-1935

PRESIDENT

Frank M. Casto.....1336 B. F. Keith Bldg., Cleveland, Ohio

PRESIDENT ELECT

George B. Winter.....Frisco Bldg., St. Louis, Mo.

VICE PRESIDENTS

Max E. Ernst.....1252 Lowry Bldg., St. Paul, Minn.
B. F. Thielen.....Paris, Texas
Frederick H. Lum, Jr.....151 Main St., Chatham, N. J.

SECRETARY

Harry B. Pinney.....212 E. Superior St., Chicago, Ill.

TREASURER

R. H. Volland.....First Capitol Nat'l Bank Bldg., Iowa City, Iowa

BOARD OF TRUSTEES

Frank M. Casto, President, Ex-Officio...1336 B. F. Keith Bldg., Cleveland, Ohio
George B. Winter, President Elect, Ex-Officio.....Frisco Bldg., St. Louis, Mo.
Harry B. Pinney, Secretary, Ex-Officio.....212 E. Superior St., Chicago, Ill.
R. H. Volland, Treasurer, Ex-Officio.....
First Capitol Nat'l Bank Bldg., Iowa City, Iowa
J. G. Hildebrand, '37.....Waterloo, Iowa
Albert R. Ross, '37.....Murdock Bldg., Lafayette, Ind.
Oren A. Oliver, '37.....Medical Arts Bldg., Nashville, Tenn.
Harvey J. Burkhart, '36.....Box 879, East Avenue P. O., Rochester, N. Y.
C. R. Lawrence, '36.....730 Bass Bldg., Enid, Okla.
Herbert C. Miller, '36.....E. 6th and Oregon Sts., Portland, Ore.
Wilfred H. Robinson, '36.....1706 Broadway, Oakland, Calif.
Harry Bear, '35.....410 Professional Bldg., Richmond, Va.
C. Willard Camalier, '35.....1726 Eye St., N. W., Washington, D. C.
Thomas L. Grisamore, '35.....29 E. Madison St., Chicago, Ill.
E. G. Meisel, '35.....121 University Place, Pittsburgh, Pa.
Marcus L. Ward, '35.....1308 Cambridge Road, Ann Arbor, Mich.
Philip E. Adams, '35.....106 Marlborough St., Boston, Mass.